

The XMM-Newton Optical Monitor Survey of the Taurus Molecular Cloud

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ABSTRACT

Context. The Optical Monitor (OM) on-board *XMM-Newton* obtained optical/ultraviolet data for the *XMM-Newton* Extended Survey of the Taurus Molecular Cloud (XEST), simultaneously with the X-ray detectors.

Aims. With the XEST OM data, we aim to study the optical and ultraviolet properties of TMC members, and to do correlative studies between the X-ray and OM light curves. In particular, we aim to determine whether accretion plays a significant role in the optical/ultraviolet and X-ray emissions. The Neupert effect in stellar flares is also investigated.

Methods. Coordinates, average count rates and magnitudes were extracted from OM images, together with light curves with low time resolution (a few kiloseconds). For a few sources, OM FAST mode data were also available, and we extracted OM light curves with high time resolution. The OM data were correlated with Two Micron All Sky Survey (2MASS) data and with the XEST catalogue in the X-rays.

Results. The XEST OM catalogue contains 2,148 entries of which 1,893 have 2MASS counterparts. However, only 98 entries have X-ray counterparts, of which 51 of them are known TMC members and 12 additional are TMC candidates. The OM data indicate that accreting stars are statistically brighter in the *U* band than non-accreting stars after correction for extinction, and have *U*-band excesses, most likely due to accretion. The OM emission of accreting stars is variable, probably due to accretion spots, but it does not correlate with the X-ray light curve, suggesting that accretion does not contribute significantly to the X-ray emission of most accreting stars. In some cases, flares were detected in both X-ray and OM light curves and followed a Neupert effect pattern, in which the optical/ultraviolet emission precedes the X-ray emission of a flare, whereas the X-ray flux is proportional to the integral of the optical flux.

Key words. Stars: coronae – Stars: flare – Stars: formation – Stars: pre-main sequence – Surveys – X-rays: stars

1. Introduction

The *XMM-Newton* Extended Survey of the Taurus Molecular Cloud (XEST) (Güdel et al. 2006a) is primarily focused on the X-ray emission of young stellar and substellar objects (YSOs). However, since *XMM-Newton* (Jansen et al. 2001) is capable of observing simultaneously in the X-rays with the European Photon Imaging Cameras (Strüder et al. 2001; Turner et al. 2001) and the Reflection Grating Spectrometers (den Herder et al. 2001), and in the optical and ultraviolet regimes with the Optical Monitor (Mason et al. 2001), we have obtained deep images and sensitive light curves, primarily in the *U* band, but also in the near-ultraviolet regime in some cases.

Simultaneous X-ray and optical/UV coverage of young stars provides the ideal means to study the physical processes occur-

ring in the stellar upper atmospheres (e.g., Stelzer et al. 2003) or the interactions between an accretion disk and a star. For example, our understanding of the physics of flares in magnetically active stars can benefit from simultaneous monitoring. In the chromospheric evaporation model (e.g., Antonucci et al. 1984), magnetic reconnection in the corona injects accelerated particles propagating along the magnetic field lines, heating the chromosphere and the transition region through collisions (evident in emission in the optical/ultraviolet). Heated material (visible in soft X-rays) then moves up along the magnetic field lines into the corona where it cools. A “Neupert” effect (Neupert 1968) should, therefore, be observed in the optical/UV and X-ray light curves, in which the time profile of the X-ray light curve is proportional to the time integral of the optical light curve (conversely, the optical flux has the same time profile as the derivative of the X-ray flux). This effect has already been observed in main-sequence active stars (Hawley et al. 1995; Güdel et al. 2002a; Hawley et al. 2003; Güdel et al. 2004; Mitra-Kraev et al. 2005). Stellar Neupert effects were also reported from X-rays and radio gyrosynchrotron emission of accelerated particles gy-

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rating along the magnetic fields (Güdel et al. 1996; Güdel et al. 2002b; Smith et al. 2005), although it should be mentioned that not all multi-wavelength observations necessarily detect typical Neupert effects (e.g., Stelzer et al. 2003; Osten et al. 2005), probably because of different conditions in the flaring source.

Optical studies of young stars have also provided evidence of rotational modulation of active regions, suggesting that a solar-type magnetic activity operates in T Tauri stars (e.g., Rydgren & Vrba 1983; Rydgren et al. 1984; Bouvier et al. 1988; Bouvier & Bertout 1989; Bouvier 1990; Bouvier et al. 1993; Vrba et al. 1993; Bouvier et al. 1995, 1997, etc.). Detailed analyses indicate that weak-line T Tauri stars (WTTS) on average rotate faster than the still accreting classical T Tau stars (CTTS), possibly due to disk locking or loss of angular momentum due to stellar winds in CTTS (Bouvier et al. 1993). In addition, rotational modulation in some CTTS can be dominated by hot spots due to accreting material falling from the accretion disk onto the stellar surface (Vrba et al. 1986; Bouvier & Bertout 1989; Vrba et al. 1989; Bouvier et al. 1993; Herbst et al. 1994; Bouvier et al. 1995).

Although most low-mass accreting stars display X-ray spectra typical of hot coronal plasma, at least a few of them display either lower temperature spectra or densities atypical of coronal, or both, indicating that accretion could play a significant role in the production of X-rays (Kastner et al. 2002; Stelzer & Schmitt 2004; Schmitt et al. 2005; Ness & Schmitt 2005; Robrade & Schmitt 2006; Telleschi et al. 2006a). In some cases, the soft X-ray component could arise from shocks in jets originating from the young accreting stars (Güdel et al. 2005; Kastner et al. 2005; Güdel et al. 2006b). In low-mass young stars with optical outbursts, the sudden rise in mass accretion rate also appears to impact on the X-ray emission. During the accretion outburst of V1647 Ori, the mean X-ray flux closely tracked the near-infrared luminosity, and the X-ray spectrum hardened (Kastner et al. 2004; Grosso et al. 2005; Kastner et al. 2006). On the other hand, Audard et al. (2005) observed little X-ray flux variability in the early epochs of the outburst, in contrast to the optical/near-infrared flux enhancements, but they found a change in the X-ray spectrum of the young star V1118 Ori from a dominant hot plasma pre-outburst to a cool plasma during the outburst. The coronal hot plasma essentially disappeared, probably because the inner accretion disk disrupted the coronal loops. Finally, accretion may also be a dominant mechanism in the more massive, accreting Herbig Ae stars (Swartz et al. 2005), although magnetically confined winds may be a good alternative as well (Telleschi et al. 2006b).

Optical and X-ray correlations of young stars can, therefore, provide important information on flare physics and rotational modulation due to spots and active regions in magnetically active stars (e.g., Flaccomio et al. 2005) or due to hot accretion spots. Multi-wavelength studies are ideal to determine to which extent accretion plays a significant role in the production of X-rays in young accreting stars. Recently, Stassun et al. (2006) studied the correlation between the optical (*BVRI*) and X-ray light curves of young stars in the Orion Nebula Cluster. The optical observations covered the 13-day *Chandra* observation of the cluster, and the typical exposure times ranged from 5 s for short exposures to 420–720 s for long exposures. However, the observing cadence was about 1 per hour for each filter. Stassun et al. (2006) found little evidence of correlations between the optical and X-ray variability, although there were some exceptions.

In this paper, we report on the Optical Monitor (OM) data obtained as part of the XEST. Section 2 describes the OM data, whereas we introduce the OM catalogue in Section 3. A vast majority of our optical (and UV in a few cases) detections is of

sources which are probably foreground or background sources. We provide the full OM catalogue of detected sources as online material, although this paper focuses specifically on known or probable TMC members (including new membership candidates identified by Scelsi et al. 2006). A separate paper focuses on the OM survey of brown dwarfs (Grosso et al. 2006a). Section 4 makes use of the OM data and data compiled by Güdel et al. (2006a) in order to derive basic properties of the OM TMC sample. Finally, since the OM and X-ray detectors observed simultaneously, we also study correlations between the optical/ultraviolet and X-ray light curves for TMC members in Section 5.

2. Optical Monitor data

The Optical Monitor (OM; Mason et al. 2001) is a 30-cm optical/UV telescope that can provide coverage in the optical and UV regimes (bandwidth 180 – 600 nm) simultaneously with the X-ray cameras. The OM detector is a micro-channel plate (MCP) intensified CCD. The final array has a format of 2048×2048 pixels, each pixel having a size of about $0''.48$, leading to a square field-of-view (FOV) of about $17' \times 17'$, which covers the central part of the X-ray cameras ($15'$ -radius FOV). The OM carries a wheel of filters (*V*, *U*, *B*, *UVW1*, *UVM2*, *UVW2*, and a broad white light filter) and 2 grisms for the visible and UV ranges. In this paper, we report on OM data taken with the *U* ($\approx 300 - 400$ nm) and *UVW2* ($\approx 175 - 250$ nm) filters. The OM point-spread-function varies from $1''.4$ to $2''$, depending on the filter. The OM can operate in the “Imaging” or “Fast” modes; of particular interest here, in the default Imaging mode (“Image” in Table 1), a set of 5 consecutive exposures is taken, each covering a different portion of the FOV. In each of the 5 exposures, a large window ($W_{1,\dots,5}$; with $1''$ pixels) is complemented by a smaller central imaging mode window of size $2' \times 2'$ with $0''.5$ pixel resolution (W_0). Thus, the sequence is exposure 1: $W_0 + W_1$, exposure 2: $W_0 + W_2$, etc. until exposure 5: $W_0 + W_5$, after which the sequence can start again. An example of the configuration can be found in the *XMM-Newton* Users’ Handbook (Ehle et al. 2005). In the default Fast mode (“Image Fast” in Table 1), a similar set of images is obtained together with an additional central window (CW; 22×23 pixels, i.e., $10''.5 \times 10''.5$) that is operated in fast mode with a time resolution of 0.5 s. Consequently, the sequence of images is exposure 1: $W_0 + W_1 + CW$, exposure 2: $W_0 + W_2 + CW$, etc. until exposure 5: $W_0 + W_5 + CW$. This means that the on-axis target should be monitored continuously with high time resolution, and 5 times in the small central $2' \times 2'$ W_0 imaging window (with each an exposure equal to the integration time of the exposure), and once in the large, central $1''$ -pixel window. If a secondary target is located in a sky area covered by the small central imaging window W_0 , it is observed in a similar fashion as above, except that no fast mode data is available. If it is located in an area outside the $2' \times 2'$ window, it will be observed only in one of the 5 consecutive large imaging window, i.e., once per OM exposure. Clearly, the best time coverage for a secondary target is when it is located in a sky area covered by the small central window. Note that other imaging modes can be used as well. For example, in “Full-Frame” imaging mode, images of the whole OM FOV can be obtained either in full resolution ($0''.5$ pixel size; “High Resolution”) or in low ($1''$ pixel size; “Low Resolution”). Additional user-specified mode can be used as well (see XEST-28 in Table 1). We remind that, because the OM FOV is smaller ($17' \times 17'$) than the EPIC field-of-view ($15'$ radius), several interesting X-ray sources did not fall on the

Table 1. OM-specific Observation Log

XEST	ObsID	RA ^a h m s	δ ^a ° ' "	PA ^a (°)	OM Filter	OM Mode	Fast Data	Image Exposures
01	0301500101	04 21 59.4	+19 32 06	80.01	UVW1	Image Fast	Y	18 × 3540s
02	0203540201	04 27 19.6	+26 09 25	82.05	U	Full-Frame Low Res ^b	N	4 × 5000s, 3170s
03	0203540301	04 32 18.9	+24 22 28	81.92	U	Image Fast	Y	20 × 1500s
04	0203540401	04 33 34.4	+24 21 08	261.88	U	Image Fast	Y	12 × 1640s
05	0203540501	04 39 34.9	+25 41 46	262.68	U	Full-Frame Low Res ^b	N	4000s, 4479s, 2 × 5000s
06	0203540601	04 04 42.9	+26 18 56	79.03	U	Full-Frame Low Res ^b	N	4 × 5000s
07	0203540701	04 41 12.5	+25 46 37	262.61	U	Full-Frame Low Res ^b	N	3 × 5000s, 1679s
08	0203540801	04 35 52.9	+22 54 23	81.90	U	Image Fast	Y	10 × 1260s, 10 × 1240s
09	0203540901	04 35 55.1	+22 39 24	261.85	U	Full-Frame Low Res ^b	N	5 × 5000s
10	0203542201	04 42 20.9	+25 20 35	262.27	U	Image Fast	Y	15 × 1780s
11	0203541101	04 21 51.1	+26 57 33	81.69	U	Full-Frame Low Res ^b	N	5 × 5000s
12	0203542101	04 35 17.4	+24 15 00	261.59	U	Image Fast	Y	15 × 1500s
13	0203541301	04 29 52.0	+24 36 47	81.55	U	Full-Frame Low Res ^b	N	3 × 5000s, 1679s
14	0203541401	04 30 30.6	+26 02 14	262.72	U	Full-Frame Low Res ^b	N	2 × 5000s, 4179s
15	0203541501	04 29 42.4	+26 32 51	262.81	U	Full-Frame Low Res ^b	Y	12 × 1260s, 5 × 1380s
16	0203541601	04 19 43.0	+27 13 34	—	—	—	—	—
17	0203541701	04 33 21.2	+22 52 41	261.86	U	Full-Frame Low Res ^b	N	3 × 4170s
18	0203541801	04 33 54.7	+26 13 28	83.07	U	Image Fast	Y	5 × 1360s, 5 × 1260s, 10 × 1200s
19	0203541901	04 32 43.0	+25 52 32	82.83	U	Image Fast	Y	15 × 1680s, 5 × 1660s
20	0203542001	04 14 12.9	+28 12 12	78.06	U	Image Fast	Y	10 × 2480s
21	0101440701	04 21 59.0	+28 18 08	—	—	—	—	—
22	0109060301	04 31 39.0	+18 10 00	83.58	UVW2	Image ^c	N	5 × 1000s
23	0086360301	04 18 31.2	+28 27 16	259.74	UVW2	Image	N	5 × 1000s
24	0086360401	04 18 31.2	+28 27 16	259.67	UVW2	Image	N	5 × 1000s
25	0152680201 ^d	04 34 55.5	+24 28 54	244.71	UVW2	Image	N	10 × 980s
26	0101440801	04 55 59.0	+30 34 02	—	—	—	—	—
27	0201550201	03 54 07.9	+31 53 01	—	—	—	—	—
28	0200370101	04 19 15.8	+29 06 27	82.13	UVW1	Science User Defined ^{c,e}	Y	25 × 4000s, 2 × 2200s

^a Nominal boresight coordinates (J2000.0) and average spacecraft position angle

^b 1024 × 1024 pixel images with 1" pixel size (17' × 17')

^c Grism exposures taken after the imaging exposures

^d This observation is part of a campaign on AA Tau that will be presented extensively elsewhere

^e 624 × 624 pixel images with 0'.5 pixel size (5' × 5') together with a 10'.5 × 10'.5 window in Fast mode

OM detector, and, therefore, no photometry or light curve could be obtained.

The OM data were reduced with the *XMM-Newton* Science Analysis System (SAS) 6.1. We have processed the “Imaging” and “Fast” mode data using the metatasks *omichain* and *omfchain*, respectively, with default parameters, except for the *omdetectminsignificance* parameter of *omichain*, which determines the minimum significance of a source to be included in the source-list file and which we changed from 1.0 to 3.0. In Table 1, we provide an observation log of the XEST fields (Güdel et al. 2006a), with an emphasis on the OM-specific parameters. In particular, we provide the imaging mode and emphasize when a Fast mode window was available, and we provide the exposures of the individual imaging windows. For example, for XEST-01, for the first exposure, the imaging windows W_0 and W_1 observed simultaneously for 3540 s, then (after some overhead delay), W_0 and W_2 observed for another 3540 s, etc. Since the XEST-01 OM data were obtained in FAST mode as well, the CW window was operating in parallel. For XEST-02, $W_0 + W_1$, $W_0 + W_2$, $W_0 + W_3$, $W_0 + W_4$ each observed for 5000 s, while the last exposure with windows W_0 and W_5 observed for 3170 s only.

For “Imaging” mode data, we obtained images and source lists for individual exposures, a mosaicked image, and a merged source list. Each individual source list included, in particular, the exposure source number, sky and galactic coordinates, raw and corrected count rates, magnitudes, quality flags, and the source identification in the final source list. Consequently, it was

possible, knowing the source identification, to obtain exposure-specific count rates and magnitudes, i.e., low time-resolution light curves.¹ However, SAS 6.1 identified a significant number of spurious sources, mostly in the ghost image near a bright star produced by internal reflection of light within the detector window, in the enhanced “ring” of emission near the center of the detector (due to the reflection of diffuse sky light from outside the FOV), and in fixed pattern noise around bright sources (Ehle et al. 2005). Consequently, we manually inspected the mosaicked image, merged source list identifications, and removed obvious misidentifications. We also modified the merged source list to ensure that the same source had the same source identification in each exposure; indeed, the *omsrclistcomb* task did not combine the source lists accurately in a few cases, i.e., mostly bright sources for which strong fixed pattern noise introduced small positional inaccuracies that were not properly identified by SAS 6.1. We note that SAS 6.5 eliminates most of the above issues; however, this version of the SAS incorrectly combines the source lists, and, therefore, we preferred not to use it. Figure 1 shows an example of an OM image with some artefacts.

For “Fast” mode data, in addition to individual images, we obtain event lists and time series files with high time resolution (the default value is 10 s with *omfchain*) for each exposure. We

¹ For point sources identified in both the small 0'.5 × 0'.5 and the larger 1" × 1" central windows, we used count rates and magnitudes from the small window because of the smaller pixel bin size and of the more frequent time sampling.

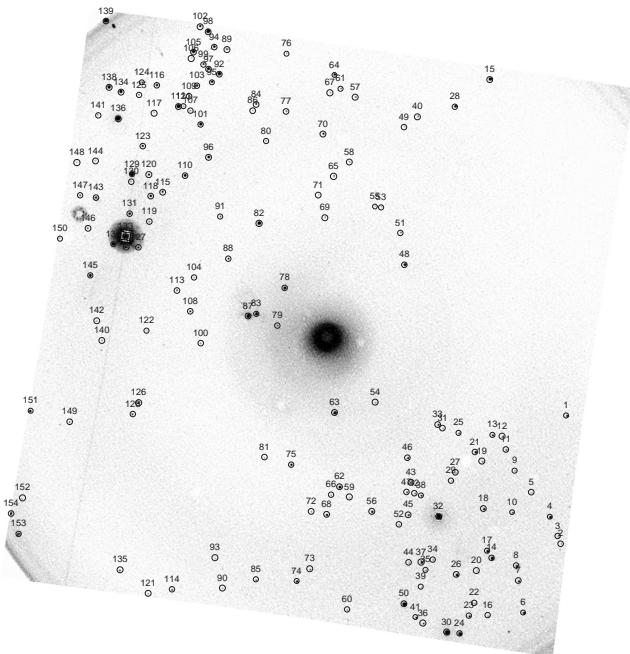


Fig. 1. Example of an OM image. This rich field (XEST-11, toward FS Tau) shows artefacts, such as the “ring” of emission at the center (due to the reflection of diffuse sky light from outside the FOV), fixed pattern noise around the bright source XEST-11-OM-133 (HD 283579, which is not classified as a TMC member), and a ghost ring below source XEST-11-OM-147 which is also caused by XEST-11-OM-133. Other artefacts can be seen (trail along the bright source, defects on the detector).

merged the different time series files into a single time series file for further analysis.

3. Optical Monitor catalogue

A catalogue of OM sources was compiled, cross-checked with the Two Micron All Sky Survey (2MASS) and the XEST X-ray sources. We provide average photometry and source coordinates as compiled in the combined source lists in the imaging mode data. We have calculated boresight corrections to OM coordinates by cross-correlating with the 2MASS catalogue (search radius of $3''$) and by means of iterative steps until the median position offsets became zero. Table 2 provides the position offsets ($\Delta X, \Delta Y$) in arcseconds ($\text{RA}_{\text{corr}} = \text{RA}_{\text{OM}} + \Delta X / \cos(\delta_{\text{2MASS}})$ and $\delta_{\text{corr}} = \delta_{\text{OM}} + \Delta Y$). We also cross-correlated the OM and the X-ray catalogues (Güdel et al. 2006a) using 2MASS-corrected coordinates (search radius of $3''$). Minor manual interventions were necessary when 2 close sources were separated in the OM but not in X-rays (UZ Tau E+W(AB), HP Tau/G2 and HP Tau/G3 AB). Finally, we remind that we used the same detection parameters for all observations. Consequently, the source detection process is not optimized to each exposure; however, a visual inspection showed that the chosen parameters were generally sufficient, although we do not claim completeness in the XEST OM catalogue.

Table 3 provides the first 30 entries of the full OM catalogue, in increasing right ascension. In Column 1, we provide the catalogue source number. Columns 2, 3, and 4 provide the 2MASS-corrected OM right ascension and declination and the positional error Δ (including the RMS error on the bore-sight shift, which was added in quadrature to the statistical 1-

Table 2. OM astrometric correction vectors in arcseconds

XEST	ΔX	ΔY	r.m.s.
01	3.086	-2.462	0.90
02	4.338	-1.016	0.62
03	3.320	-0.970	0.52
04	-1.471	3.632	0.83
05	-3.561	4.579	0.52
06	3.948	-3.227	0.57
07	-3.240	4.412	0.99
08	2.955	-0.800	0.81
09	-2.728	5.588	0.62
10	-2.219	2.623	0.61
11	3.847	-0.137	0.61
12	-2.675	3.093	0.61
13	2.143	-1.162	0.86
14	-4.529	3.239	0.68
15	-3.891	5.163	0.71
17	-3.824	5.114	0.58
18	2.893	-1.391	0.92
19	3.617	-0.044	0.62
20	6.201	-5.232	0.48
22	1.586	-1.008	0.06
23	0.368	1.105	0.00 ^a
24	-1.363	0.720	0.00 ^a
25	-3.065	4.090	1.63
28	5.519	-0.994	0.77

^a Only V410 Tau detected in the OM

sigma positional error calculated for each source). Column 5 provides the XEST OM identification in the xx-OM-zzz notation in Column 2, where xx refers to the XEST exposure and zzz refers to the OM identification for this XEST exposure. Columns 6 and 7 give the 2MASS cross-identification, if found, and the offset ρ_1 between the OM corrected coordinates and the 2MASS coordinates. Columns 8 and 9 give the XEST X-ray identification (in xx-yyy notation, see Güdel et al. 2006a), if found, and the offset ρ_2 between the OM and X-ray corrected coordinates. Column 10 gives the average magnitude and its uncertainty, and Column 11 the detection significance. For clarity, we have added in the exponent a ‡ character if the filter was UVW2 and a † character if the filter was UVW1. No special character was added for the commonly used U filter. We provide the full OM catalogue as online material (Table A.1).

The XEST OM catalogue contains 2148 entries, among which 1893 have 2MASS counterparts and 98 have XEST X-ray counterparts. Out of these 98 sources, 51 are TMC members according to the master list from Güdel et al. (2006a) and 12 are new TMC candidates identified by Scelsi et al. (2006). Thus 35 OM sources had X-ray counterparts but were not classified as TMC members or candidates. Note that V410 Tau ABC (XEST-23-032 & XEST-24-028) was counted twice in the OM catalogue since it was observed in two different XEST observations. In addition, UZ Tau E+W(AB) (XEST-19-049) were not separated in X-rays but were so in the OM (UZ Tau W = XEST-19-OM-092, UZ Tau E = XEST-19-OM-094). Similarly, the X-ray source XEST-08-051 was attributed to both HP Tau/G3 AB and HP Tau/G2 (centroid fitting suggests that the X-rays come mostly from HP Tau/G2); however, they were separated in the OM data (XEST-08-OM-038 for HP Tau/G3 AB and XEST-08-OM-040 for HP Tau/G2).

There were 2 TMC members detected in the OM but not detected in X-rays with *XMM-Newton* (FV Tau/c AB, XEST-02-OM-020 and 2MASS J04141188+2811535, XEST-20-OM-002). However, FV Tau/c AB is very close to FV Tau AB (XEST-

Table 3. XEST OM Catalogue (first thirty entries)

#	RA _{corr} h m s	δ_{corr} $^{\circ} \text{ } '$ "	Δ (")	XEST OM	2MASS	ρ_1 (")	XEST	ρ_2 (")	Mag ^a	Signif.
1	04 03 59.95	+26 23 31.8	0.60	06-OM-001	04035989+2623319	0.73			20.62 ± 0.09	15.2
2	04 04 00.62	+26 24 43.9	0.60	06-OM-002	04040056+2624441	0.81			19.05 ± 0.04	21.4
3	04 04 00.78	+26 23 29.8	0.57	06-OM-003	04040075+2623295	0.45			16.79 ± 0.01	114.3
4	04 04 02.24	+26 24 59.7	0.57	06-OM-004	04040217+2624595	0.84			16.02 ± 0.00	176.6
5	04 04 03.27	+26 22 24.6	0.63	06-OM-005	04040327+2622244	0.13			19.95 ± 0.09	10.4
6	04 04 03.59	+26 25 02.8	0.60	06-OM-006					18.33 ± 0.03	38.5
7	04 04 04.69	+26 24 48.7	0.63	06-OM-007	04040467+2624478	0.84			20.15 ± 0.10	8.5
8	04 04 07.46	+26 19 10.4	0.61	06-OM-008	04040741+2619102	0.60			19.19 ± 0.04	19.6
9	04 04 08.17	+26 17 50.7	0.59	06-OM-009	04040814+2617508	0.33			18.38 ± 0.01	37.5
10	04 04 08.31	+26 19 18.6	0.63	06-OM-010					20.46 ± 0.17	6.2
11	04 04 08.43	+26 19 49.0	0.63	06-OM-011					20.15 ± 0.12	8.4
12	04 04 09.26	+26 19 10.1	0.61	06-OM-012	04040919+2619098	0.88			19.26 ± 0.12	18.1
13	04 04 09.35	+26 14 06.2	0.59	06-OM-013	04040936+2614059	0.32			18.65 ± 0.03	29.7
14	04 04 09.50	+26 15 16.7	0.64	06-OM-014					20.87 ± 0.08	4.4
15	04 04 09.57	+26 22 03.8	0.58	06-OM-015	04040952+2622034	0.62			17.38 ± 0.02	78.6
16	04 04 09.87	+26 19 00.6	0.64	06-OM-016					20.51 ± 0.16	6.0
17	04 04 10.24	+26 21 58.7	0.60	06-OM-017	04041018+2621581	0.98			18.94 ± 0.05	24.4
18	04 04 10.44	+26 22 57.3	0.64	06-OM-018					20.84 ± 0.14	4.7
19	04 04 10.53	+26 19 01.3	0.58	06-OM-019	04041051+2619011	0.33			17.67 ± 0.03	63.8
20	04 04 11.02	+26 10 57.7	0.61	06-OM-020	04041104+2610573	0.51			19.19 ± 0.06	19.6
21	04 04 11.19	+26 20 04.0	0.61	06-OM-021	04041116+2620036	0.50			19.57 ± 0.05	14.3
22	04 04 11.22	+26 10 47.7	0.63	06-OM-022					20.21 ± 0.19	7.7
23	04 04 11.34	+26 25 16.4	0.57	06-OM-023	04041129+2625162	0.65			16.77 ± 0.01	115.6
24	04 04 11.82	+26 11 41.1	0.64	06-OM-024					20.92 ± 0.17	4.1
25	04 04 11.83	+26 25 03.8	0.62	06-OM-025	04041178+2625035	0.64			19.62 ± 0.13	13.3
26	04 04 11.85	+26 12 03.2	0.62	06-OM-026					19.63 ± 0.09	13.5
27	04 04 11.89	+26 11 24.4	0.59	06-OM-027	04041191+2611239	0.58			18.59 ± 0.04	32.1
28	04 04 11.93	+26 19 12.0	0.60	06-OM-028	04041190+2619118	0.25			19.00 ± 0.05	22.8
29	04 04 12.66	+26 12 44.4	0.63	06-OM-029			06-029	2.86	20.13 ± 0.12	8.7
30	04 04 13.03	+26 11 41.6	0.58	06-OM-030	04041305+2611414	0.27			18.00 ± 0.02	50.3

^a U-band except if identified with [†] (UVW1) or [‡] (UVW2).**Table 4.** Detection statistics

	#	Type ^a							
		0	1	2	3	4	5	9	
Detected OM sources	2148								
X-ray sources in OM FOV	916								
OM detections not detected in X-rays	2	0	0	1	0	1	0	0	
OM detections also detected in X-rays	98								
TMC members detected in X-rays and OM	51	0	1	33	17	0	0	0	
TMC candidates detected in X-rays and OM	12								
TMC members detected in X-rays but not in OM	34	0	7	8	8	4	0	7	
TMC candidates detected in X-rays but not in OM	21								
TMC members detected in X-rays but outside OM FOV ^b	55	0	1	16	32	4	2	0	

^a See Güdel et al. (2006a) and text for the definition of the object type^b Statistics for XEST observations with OM data

02-013 = XEST-02-OM-017) and its faint X-ray emission may have been overshadowed by the stronger X-ray flux of FV Tau AB. Note that FV Tau/c AB was detected by *Chandra* (Güdel et al. 2006a). A similar case occurred for the brown dwarf 2MASS J04141188+2811535 (Luhman 2004), which is close to the X-ray bright V773 Tau (XEST-20-042 = XEST-20-OM-003). The OM data of the brown dwarf is addressed in a separate paper (Grosso et al. 2006a).

While the above detection numbers start from OM detections, we have also taken a different approach, starting from the catalog of X-ray sources detected with XEST: we have determined that 916 X-ray sources had coordinates such that they fell on the OM detector. Out of those, only 98 are detected in the OM

(see above), while 34 TMC members of TMC detected in X-rays remained undetected in the OM. In addition, 21 new TMC candidates detected in X-rays (Scelsi et al. 2006) were not detected in the OM. Table 4 summarizes the detection statistics pertaining to the OM/X-ray correlations. The object type (as defined by Güdel et al. 2006a, i.e., ‘0’ and ‘1’ for a protostar of Class 0 or Class I, ‘2’ for an accreting (classical) T Tau star usually showing a Class-II IR spectrum, ‘3’ for a weak-lined or Class-III object, ‘4’ for a brown dwarf, ‘5’ for an Herbig Ae star, and ‘9’ for uncertain classifications or other object types) is given when relevant.

No Type 0 object was in our sample since the sole object surveyed was observed by *Chandra* only and remained undetected

in X-rays (L1527 IRS; Güdel et al. 2006a). For TMC members detected in the X-rays and falling on the OM FOVs, the OM detection rate was 12.5 % (1 out of 8) for Type 1 objects, whereas this rate reached 80.5 % in Type 2 objects. Type 3 objects had a high 68 % detection rate. Interestingly, only 1 brown dwarf was detected in the OM, whereas 11 such objects fell on the OM FOV and 4 of them were detected in X-rays (Grosso et al. 2006a,b). We remind that the numbers reported in Table 4 makes no attempt not to count duplicates. For example, CFHT-Tau 5, detected in X-rays in two XEST observations (XEST-03-031 = XEST-04-003), was counted once in “TMC X-ray OM non-detections” since it fell on the OM detector but remained undetected in XEST-03, and once in “TMC X-ray outside OM FOV” since it fell off the OM detector in XEST-04.

Tables 5 and 6 repeat some of the columns in Table A.1 for TMC members and TMC candidates, respectively, but also provide the name of the TMC source (from Güdel et al. 2006a) or “(TMC cand)” (from Scelsi et al. 2006). The average count rate μ (corrected for coincidence losses and aperture radius) and its error $\Delta\mu$ are also given, after calculation from the magnitude and its error². We used the zero-point magnitudes given in the *XMM-Newton* UHB ($Z_U = 18.2593$, $Z_{UVW1} = 17.1882$, $Z_{UVW2} = 14.8026$; Ehle et al. 2005). Note that this calibration does not take into account corrections specific to the source’s spectral type.

4. Properties of the OM Taurus sample

We focus in this section on some of the OM properties of the TMC sample as defined in Güdel et al. (2006a) that were detected in both X-rays and in the OM. Specifically, we focus on whether correlations can be found, e.g., between the X-ray luminosity and the OM magnitude, and on the *U*-band properties of weak-lined T Tau stars and classical T Tau stars. The low number of detections of Type 1 sources is such that we will not discuss them.

Figure 2 shows the scatter plot of X-ray luminosities (as derived from the DEM method; see Güdel et al. 2006a) as a function of the observed OM magnitude (*U*-band or ultraviolet UVW1 and UVW2 bands). We used different symbols for the various types of stars. There is no strong evidence that any correlation exists in any type or any OM filter. However, at least one trend can be noticed: Type 2 stars (usually CTTS) are overall fainter in X-rays than Type 3 stars (usually WTTS). In fact, at a given OM magnitude, there is a wide range of X-ray luminosities below 10^{31} erg s⁻¹ in Type 2 stars. Fig. 3 shows the cumulative distribution of X-ray count rates in Type 2 and 3 stars that were detected in both OM and X-rays. A Kolmogorov-Smirnov (K-S) test gives a significance level of $P = 0.0055$ that both distributions are compatible ($D = 0.49$; the D statistic is the maximum vertical deviation between the two curves), indicating that the two cumulative distributions differ at a high significance level. This result is discussed in detail in Güdel et al. (2006a) and Telleschi et al. (2006a).

Despite the clear difference in X-ray luminosity between Type 2 and 3 stars, there is little evidence that the observed OM magnitude of Type 2 stars are much different from those of Type 3 stars (Fig. 4). Indeed, a K-S test gives a significance level of $P = 0.54$ ($D = 0.25$). If the observed OM magnitudes scale with L_* , then the similar distributions for Type 2 and 3 stars would not

² $\log \mu = -0.4(m-Z)$, $\Delta\mu/\mu = (1-x)/(1+x)$, where $\log x = -0.8\Delta m$, m and Δm are the source’s magnitude and its error, and Z is the zero-point magnitude.

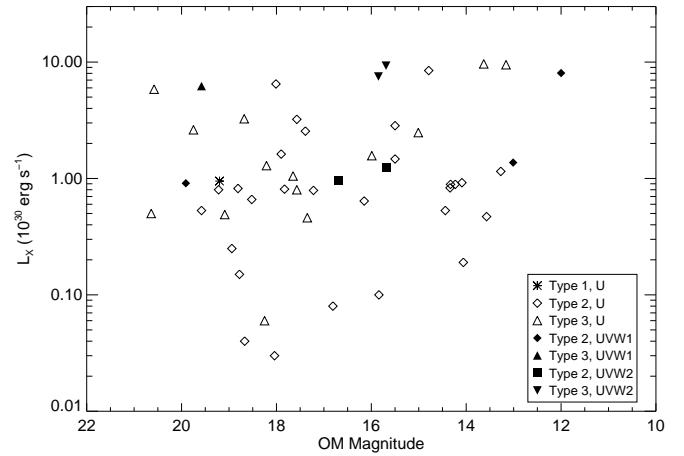


Fig. 2. X-ray luminosity (L_X) in 10^{30} erg s⁻¹ as a function of the observed OM magnitude. Various types of stars are identified (see text). Ultraviolet magnitudes are identified with filled symbols.

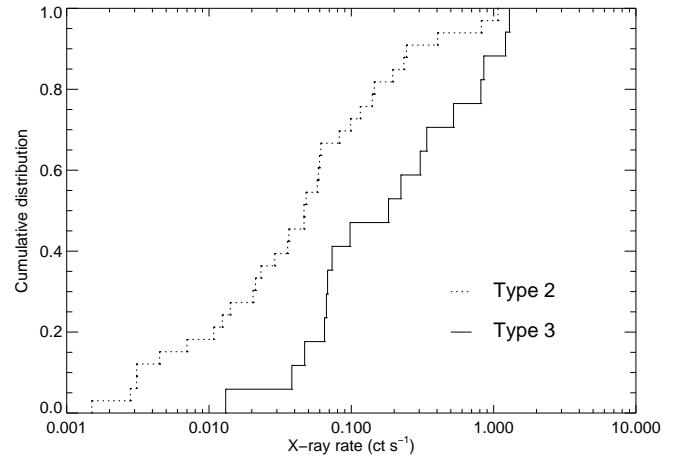


Fig. 3. Cumulative distributions of X-ray count rates of Type 2 and 3 stars.

be surprising, and again, we would find the CTTS to be fainter only in the X-rays (Fig. 3), pointing at a true deficiency of emission in that wavelength range (Telleschi et al. 2006a). However, it is important to keep in mind that the observed magnitudes could be biased by certain factors. Therefore, we aim to test the following hypotheses that could produce an observational bias: I) Bolometric luminosities in Type 2 and Type 3 stars are different; II) The binary fraction is higher in one object type than another; III) Extinction in the *U* band is stronger for one type than for the other; IV) One object type has a significant excess in the *U*-band.

4.1. Hypothesis I

Figure 5 shows the cumulative distribution of the star’s luminosity (see Güdel et al. 2006a) for Type 2 and 3 stars detected in the *U* band. Note that we used the luminosity of the primary component if available for multiples (Table 9 in Güdel et al. 2006a). There is no evidence that the stellar luminosity of Type 2 stars is different from that of Type 3 stars, as indicated by the high significance of a K-S test ($D = 0.16$, $P = 0.97$). Therefore, hypothesis I can be safely rejected as a potential biasing factor.

Table 5. XEST OM catalogue of TMC members detected in X-rays and in the OM

RA _{corr}	δ_{corr}	XEST OM	XEST	Name	Type	Mag ^a	Rate _{OM}	L_X^b	Rate _X
04 14 12.92	+28 12 12.6	20-OM-003	20-042	V773 Tau ABC	3	13.16 ± 0.02	109.13	9.49	1.2113
04 14 13.58	+28 12 49.4	20-OM-004	20-043	FM Tau	2	14.44 ± 0.07	33.76	0.53	0.0611
04 14 17.02	+28 10 57.9	20-OM-005	20-046	CW Tau	2	15.50 ± 0.10	12.73	2.84	0.0015
04 14 17.66	+28 06 09.8	20-OM-006	20-047	CIDA 1	2	18.04 ± 0.15	1.23	0.03	0.0031
04 18 31.10	+28 27 16.2	23-OM-001	23-032	V410 Tau ABC	3	15.85 ± 0.15 [‡]	0.38	3.76	1.2910
04 18 31.10	+28 27 16.2	24-OM-001	24-028	V410 Tau ABC	3	15.69 ± 0.11 [‡]	0.44	4.66	0.8534
04 19 15.84	+29 06 26.7	28-OM-014	28-100	BP Tau	2	13.01 ± 0.10 [†]	46.80	1.37	0.2343
04 21 43.27	+19 34 12.9	01-OM-022	01-028	IRAS 04187+1927	2	19.91 ± 0.31 [†]	0.08	0.91	0.0481
04 21 59.45	+19 32 06.4	01-OM-039	01-045	T Tau N(+Sab)	2	12.00 ± 0.04 [†]	119.13	8.05	0.8189
04 22 02.17	+26 57 31.5	11-OM-087	11-057	FS Tau AC	2	17.57 ± 0.00	1.88	3.22	0.1449
04 22 04.86	+19 34 48.3	01-OM-042	01-054	RX J0422.1+1934	3	19.58 ± 0.08 [†]	0.11	3.11	0.3390
04 22 16.76	+26 54 56.6	11-OM-126	11-079	CFHT-Tau 21	2	18.78 ± 0.18	0.62	0.15	0.0070
04 26 53.56	+26 06 54.6	02-OM-017	02-013	FV Tau AB	2	19.58 ± 0.09	0.30	0.53	0.0212
04 27 04.69	+26 06 15.9	02-OM-028	02-022	DG Tau A	2	13.57 ± 0.05	75.08	0.47 ^c	0.0290
04 29 20.73	+26 33 40.3	15-OM-035	15-020	JH 507	3	17.35 ± 0.04	2.30	0.46	0.0382
04 29 23.71	+24 33 00.2	13-OM-001	13-004	GV Tau AB	1	19.20 ± 0.06	0.42	0.95 ^c	0.0293
04 29 41.59	+26 32 58.0	15-OM-112	15-040	DH Tau AB	2	14.79 ± 0.04	24.38	8.46	1.0729
04 29 42.52	+26 32 49.1	15-OM-118	15-042	DI Tau AB	3	15.99 ± 0.01	8.11	1.57	0.0979
04 30 44.25	+26 01 24.4	14-OM-258	14-057	DK Tau AB	2	14.09 ± 0.14	46.54	0.92	0.0989
04 31 40.07	+18 13 57.2	22-OM-002	22-047	XZ Tau AB	2	16.70 ± 0.15 [‡]	0.17	0.96	0.2440
04 31 50.61	+24 24 17.7	03-OM-001	03-005	HK Tau AB	2	16.81 ± 0.09	3.81	0.08	0.0045
04 32 15.39	+24 28 59.3	03-OM-007	03-016	Haro 6-13	2	19.22 ± 0.19	0.41	0.80	0.0141
04 32 18.84	+24 22 27.5	03-OM-008	03-019	V928 Tau AB	3	17.65 ± 0.04	1.76	1.05	0.0732
04 32 30.58	+24 19 57.4	03-OM-015	03-022	FY Tau	2	17.83 ± 0.17	1.48	0.81	0.0822
04 32 31.77	+24 20 02.9	03-OM-016	03-023	FZ Tau	2	16.15 ± 0.06	6.99	0.64	0.0232
04 32 42.84	+25 52 31.3	19-OM-092	19-049	UZ Tau W	2	14.23 ± 0.04	40.86	0.89	0.0465
04 32 43.05	+25 52 31.1	19-OM-094	19-049	UZ Tau E	2	14.33 ± 0.02	37.37	0.89	0.0465
04 32 49.10	+22 53 03.0	17-OM-001	17-009	JH 112	2	18.81 ± 0.05	0.60	0.82	0.0357
04 33 34.05	+24 21 16.9	04-OM-018	04-034	GI Tau	2	14.34 ± 0.07	36.97	0.83	0.0364
04 33 34.54	+24 21 05.6	04-OM-020	04-035	GK Tau AB	2	15.50 ± 0.09	12.73	1.47	0.1404
04 33 36.80	+26 09 49.6	18-OM-002	18-019	IS Tau AB	2	18.52 ± 0.11	0.79	0.66	0.0586
04 33 51.98	+22 50 30.3	17-OM-066	17-058	CI Tau	2	14.06 ± 0.08	48.00	0.19	0.0204
04 33 54.61	+26 13 26.8	18-OM-004	18-030	IT Tau AB	2	18.01 ± 0.05	1.25	6.49	0.4041
04 34 55.42	+24 28 52.7	25-OM-003	25-026	AA Tau	2	15.67 ± 0.18 [‡]	0.45	1.24	0.0597
04 35 20.93	+22 54 23.4	08-OM-005	08-019	FF Tau AB	3	17.57 ± 0.03	1.89	0.80	0.0681
04 35 27.39	+24 14 58.5	12-OM-077	12-040	DN Tau	2	13.27 ± 0.04	98.91	1.15	0.1955
04 35 40.94	+24 11 09.2	12-OM-096	12-059	CoKu Tau 3 AB	3	20.58 ± 0.60	0.12	5.85	0.5224
04 35 41.80	+22 34 11.8	09-OM-070	09-022	KPNO-Tau 8	3	20.64 ± 0.04	0.11	0.50	0.0668
04 35 47.36	+22 50 20.6	08-OM-032	08-037	HQ Tau AB	3	15.01 ± 0.04	20.03	2.48	0.3050
04 35 51.10	+22 52 39.7	08-OM-034	08-043	KPNO-Tau 15	3	19.75 ± 0.13	0.25	2.62	0.2232
04 35 52.77	+22 54 22.7	08-OM-036	08-048	HP Tau AB	2	17.39 ± 0.04	2.22	2.55	0.1156
04 35 53.52	+22 54 08.6	08-OM-038	08-051	HP Tau/G3 AB	3	18.21 ± 0.07	1.05	1.29	0.0648
04 35 54.16	+22 54 12.9	08-OM-040	08-051	HP Tau/G2	3	13.63 ± 0.04	70.80	9.65	0.8136
04 35 56.84	+22 54 34.9	08-OM-044	08-058	Haro 6-28 AB	2	18.94 ± 0.12	0.53	0.25	0.0124
04 39 20.87	+25 45 02.8	05-OM-002	05-013	GN Tau AB	2	17.22 ± 0.11	2.61	0.79	0.0108
04 40 49.61	+25 51 19.2	07-OM-006	07-011	JH 223	3	18.25 ± 0.04	1.01	0.06	0.0131
04 42 05.46	+25 22 56.0	10-OM-002	10-017	CoKuLk332/G2 AB	3	18.68 ± 0.06	0.68	3.26	0.1826
04 42 07.33	+25 23 03.8	10-OM-003	10-018	CoKuLk332/G1 AB	3	19.09 ± 0.15	0.47	0.49	0.0470
04 42 07.77	+25 23 12.3	10-OM-004	10-020	V955 Tau AB	2	17.90 ± 0.08	1.39	1.62	0.0576
04 42 21.06	+25 20 34.1	10-OM-006	10-034	CIDA 7	2	18.67 ± 0.09	0.68	0.04	0.0028
04 42 37.66	+25 15 37.2	10-OM-010	10-045	DP Tau	2	15.84 ± 0.03	9.29	0.10 ^c	0.0031

^a U-band except if identified with [†] (UVW1) or [‡] (UVW2).^b L_X (0.3 – 10 keV) in 10^{30} erg s⁻¹ from the DEM method.^c L_X (0.3 – 10 keV) of the hard component from Güdel et al. (2006b).

4.2. Hypothesis II

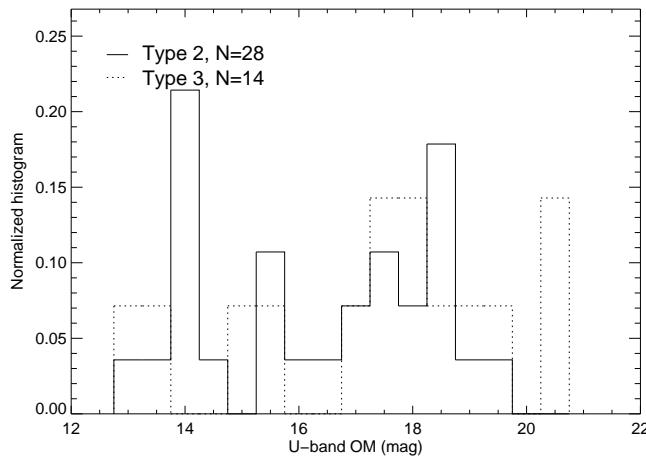
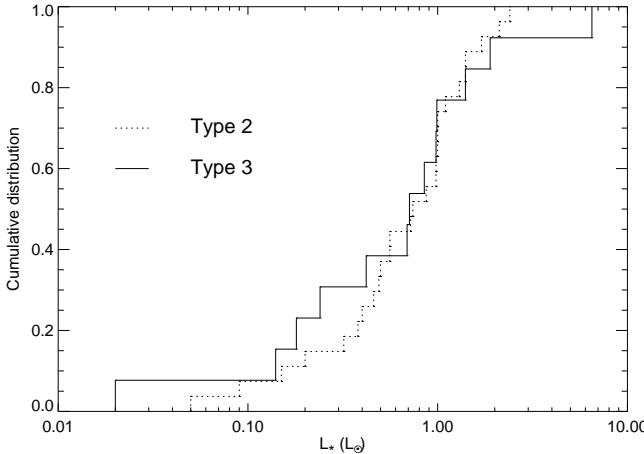
In our OM U-band sample, there are 14 and 9 TMC stars of Type 2 and 3, respectively, with more than 1 component. Therefore, we created cumulative distributions of the OM magnitude for the remaining single components (14 and 5 stars for Type 2 and 3, respectively): There is no evidence of a difference in the OM magnitudes for single Type 2 and 3 stars (K-S test: $D = 0.37$, $P = 0.58$). Therefore, hypothesis II is also rejected.

4.3. Hypothesis III

We used extinction magnitudes in the J band (A_J) if available, and determined the A_U magnitudes. Our procedure was the following: first, we calculated A_J/A_V and A_U/A_V ratios based on coefficients given by Cardelli et al. (1989): $A_J/A_V = 0.4008 - 0.3679/R_V$ and $A_U/A_V = 0.9530 + 1.9090/R_V$, where we used $R_V = 5.5$. Indeed such a value gives a better fit of the observed

Table 6. XEST OM catalogue of TMC candidates detected in X-rays and in the OM

RA _{corr}	δ _{corr}	XEST OM	XEST	Name	Mag ^a	Rate _{OM}	L _X ^b	Rate _x
04 04 24.45	+26 11 12.0	06-OM-079	06-041	(TMC cand)	18.02 ± 0.05	1.25	7.3	17.1
04 14 52.31	+28 05 59.7	20-OM-010	20-071	(TMC cand)	19.87 ± 0.25	0.23	171	159
04 22 15.72	+26 57 05.3	11-OM-122	11-078	(TMC cand)	20.98 ± 0.14	0.08	23	9.4
04 22 27.29	+26 59 49.4	11-OM-150	11-088	(TMC cand)	20.11 ± 0.08	0.18	1.6	2.1
04 29 35.98	+24 35 57.0	13-OM-002	13-010	(TMC cand)	20.47 ± 0.23	0.13	68	22.1
04 29 36.29	+26 34 23.2	15-OM-093	15-034	(TMC cand)	18.70 ± 0.11	0.66	10	24.4
04 30 25.21	+26 02 56.9	14-OM-163	14-034	(TMC cand)	16.86 ± 0.01	3.62	0.35	0.8
04 33 33.07	+22 52 50.7	17-OM-028	17-043	(TMC cand)	20.66 ± 0.36	0.11	1.2	20.4
04 33 52.54	+22 56 27.0	17-OM-070	17-059	(TMC cand)	19.12 ± 0.06	0.45	40	57.4
04 33 55.64	+24 25 01.7	04-OM-044	04-060	(TMC cand)	17.30 ± 0.01	2.42	0.74	1.3
04 35 52.88	+22 50 57.8	08-OM-037	08-049	(TMC cand)	20.06 ± 0.21	0.19	115	118
04 35 58.93	+22 38 35.2	09-OM-143	09-042	(TMC cand)	15.37 ± 0.03	14.29	172	269

^a U-band.^b L_X (0.3 – 10 keV) in 10³⁰ erg s⁻¹ from the DEM method.**Fig. 4.** Histogram of OM U magnitudes for Type 2 and 3 stars.**Fig. 5.** Cumulative distributions of stellar luminosity of Type 2 and 3 objects detected in the U filter.

A_J/A_V values.³ Then, we calculate the estimated extinction magnitude in the U band, A_U:

$$A_U = \frac{A_U A_V}{A_V A_J} A_J.$$

³ When more than one extinction magnitude was available for multiples, we used the value from the primary.

We obtained the distributions of A_U for Type 2 and 3 stars observed with the OM in the U band. Unexpectedly, the cumulative distributions do not differ significantly. As a safety check, we calculated A_U from A_V (A_U = A_U/A_V) and found the same result. Since A_V is more subject to optical veiling than A_J, we therefore preferred to use A_U from A_J in this paper.

Although the distributions of extinction magnitudes are overall similar in our sample, we have noticed that they are correlated with the observed U-band magnitude in Type 2 stars, but not in Type 3 stars. It appears that, in our sample, Type 2 stars with fainter U magnitudes suffer from more extinction than brighter Type 2 stars. Therefore, we have used the above A_U to correct the observed OM U-band magnitudes and we constructed the cumulative distribution (Fig. 6). The distributions are significantly different, with Type 2 stars being much brighter in the U-band than Type 3 stars (K-S statistic D = 0.44 with a significance level P of 0.05).

Therefore, hypothesis III appears to be correct in the sense that Type 2 stars are in fact brighter in the U-band but suffer more extinction than Type 3 stars, as could be expected based on observed properties of young stars. We emphasize, however, that this trend is opposite to the trend in X-rays where CTTS are *fainter*. Nevertheless, as shown earlier, both types of stars have similar stellar luminosities, indicating that there must be a U-band excess in Type 2 stars. Therefore, we need to address hypothesis IV before we can draw any firm conclusion.

4.4. Hypothesis IV

To determine the U-band excesses, we used the distance modulus ($m - M = 5.73$ for a distance to the TMC of 140 pc) to calculate the corrected absolute U-band magnitude, M_U, from the observed extinction-corrected U magnitude. We then determined the stellar photospheric absolute U magnitude tabulated by Siess et al. (2000) (that use a Z = 0.02 metallicity and the conversion table of Kenyon & Hartmann 1995). We finally compared the stellar photospheric M_U with the observed extinction-corrected absolute U magnitude. Figure 7 shows the normalized histograms of the U-band excesses. We provide distributions determined from A_U that was calculated either from A_J (left figure) or A_V (right figure). The distributions of excesses are different, as shown from Kolmogorov-Smirnov tests of the cumulative distributions of excesses that give very low probabilities (P = 0.16 and P = 0.04 for excesses derived from A_J and A_V, respectively). Type 2 stars showing generally U-band excess by 0 – 3 mag, whereas Type 3 stars either show no excess or small

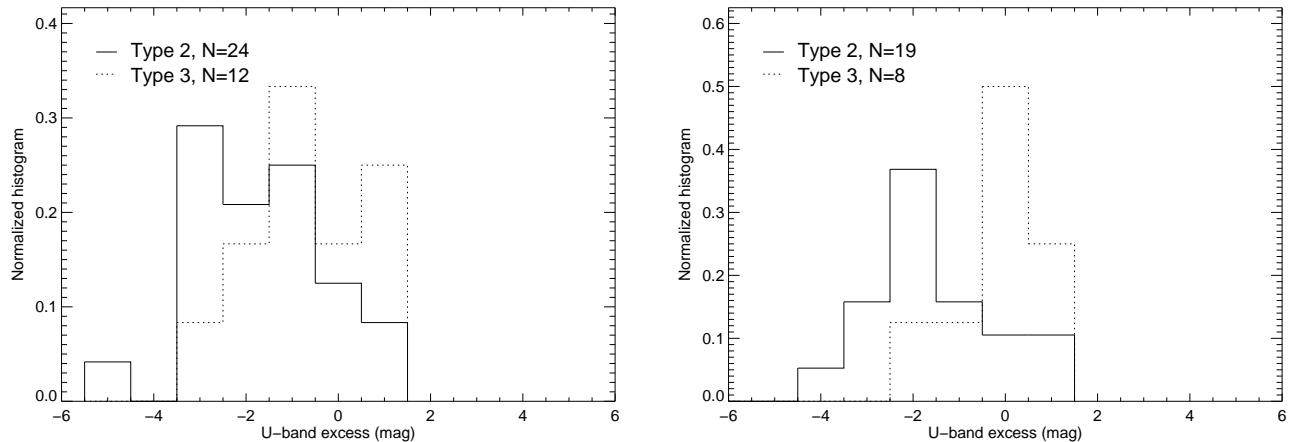


Fig. 7. Normalized distributions of U -band excesses for Type 2 and 3 stars. Excesses determined when A_J was used to calculate A_U are shown in the left figure, whereas excesses determined with A_V used are shown in the right figure.

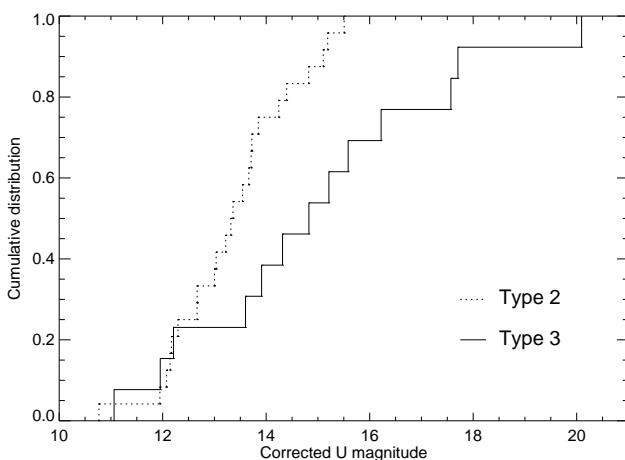


Fig. 6. Cumulative distributions of U -band OM magnitudes after correction for extinction. Type 2 stars have brighter OM magnitudes than Type 3 stars. Stars with known T_{eff} and A_J are shown.

U -band deficiency. There are exceptions for stars of both types, probably due to inaccurate background subtraction (mostly due to the central ghost emission at the center of the OM image), inaccurate extinction correction, binary effects, lower than expected count rate in bright stars due to instrumental effect (fixed pattern noise).

In conclusion, we have shown that binarity and stellar luminosity in our sample cannot bias the observed OM magnitudes. However, although the extinction magnitudes are statistically similar in Type 2 and 3 stars, they are correlated in Type 2 stars with the observed magnitudes. After correction for extinction, Type 2 stars are found to be brighter than Type 3 stars, which can be explained by a U -band excess due to accretion.

5. Optical and X-ray light curves

Figure B.1 presents the collection of simultaneous X-ray and optical/UV light curves of XEST sources detected in both X-rays and in the OM. The X-ray light curves are shown on the top panel with the XEST identification, while the OM light curve is shown in the bottom panel with the XEST-OM identification. The OM light curves are taken from the IMAGING mode data

only. The x -axis OM error bars correspond to the length of an exposure identification. If a TMC member is associated with the source, its name is given next to the XEST or XEST-OM identification. Special cases occur, e.g., when two nearby sources were not separated in X-rays but they were in the OM. For example, the X-ray light curve of XEST-19-049 is associated with both UZ Tau E and W, whereas we manually extracted (due to problems in the SAS software to properly extract both sources due to the close separation) the OM light curves for UZ Tau W (AB) and UZ Tau E (XEST-19-OM-092 and XEST-19-OM-094, respectively)⁴. A similar case is reported for HP Tau/G3 AB and HP Tau/G2 (XEST-08-051). The X-ray light curve, although dominated by HP Tau/G2, has some contribution (about 8 %; see Telleschi et al. 2006a) from HP Tau/G3 AB. In contrast, the OM cleanly separated their emission (HP Tau/G3 AB = XEST-08-OM-038; HP Tau/G2 = XEST-08-OM-40). TMC candidates (Scelsi et al. 2006) are identified as well. X-ray and OM sources presently not identified as either TMC member or TMC candidate only have their XEST and XEST-OM identifications.

As mentioned earlier, our database includes several cases where only a few OM points were available for a specific target (e.g., CoKu Tau 3 AB; CW Tau; CIDA 1, etc.). However, there are several cases for which we have very good coverage even with the OM IMAGING data (e.g., FM Tau; V773 Tau ABC; CIDA 7; etc.). DG Tau A (XEST-02-022 = XEST-02-OM-028) is a good example where even low time resolution was able to catch the U -band emission of a flare, which peaked before the peak in the X-rays, a signature of the Neupert effect. Güdel et al. (2006b) give a full analysis of the DG Tau A case and make use of the OM light curve.

In addition, some OM data were obtained in FAST mode, allowing us to obtain high time resolution light curves. Figure 8

⁴ The OM light curves were obtained by manually determining the position of the two stars in each exposure image, and then using an IDL routine to extract the light curve. We used radii of half the stars' separation ($3''48$, i.e., a radius of 3.65 pixels for the central window), which minimizes the contamination of one source onto the second one. We corrected for aperture, applied the theoretical and empirical corrections, corrected for deadtime, and applied a time-dependent sensitivity correction. The above procedure is similar to what the SAS task *om-source* does; however, the latter cannot yet extract for radii lower than 6 pixels. We defined an annulus of radii 20 and 30 pixels ($\approx 10''$ and $15''$) for the local background contribution. See Grosso et al. (2006a) for a detailed description of the procedure.

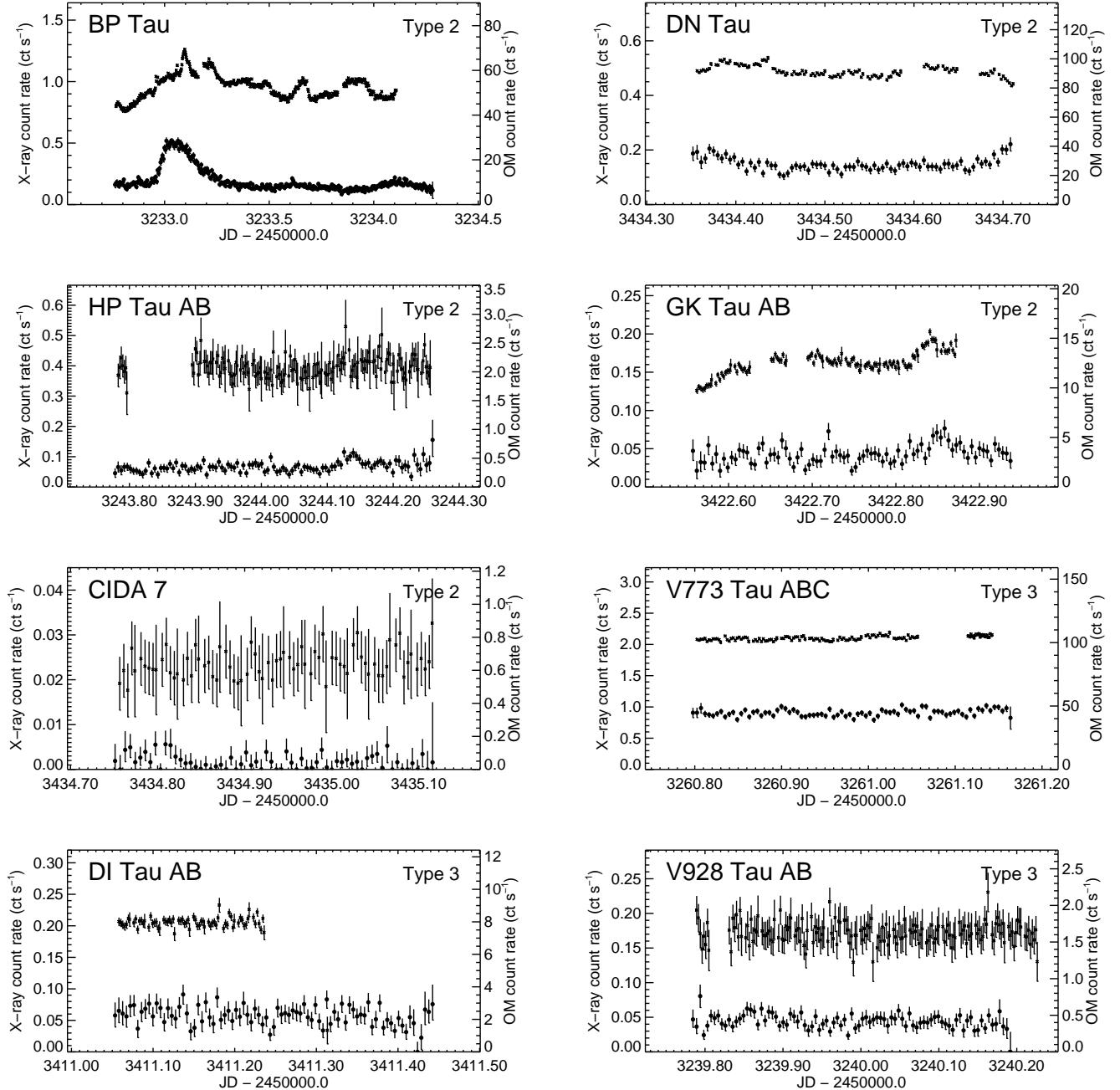


Fig. 8. The TMC sample of stars with OM FAST mode data. The upper curve in each panel is the OM light curve (right y-axis), whereas the lower curve is the X-ray light curve (left y-axis). The OM light curves were rebinned to bin sizes of 200 s, except for CIDA 7, which required a bin size of 400 s. The type of the source is given together with the source name. The OM FAST data of IT Tau and UZ Tau EW are not shown since the sources were not properly placed on the small OM FAST window, and thus the light curves were unreliable. In addition, the T Tau OM FAST light curve is the subject of a separate paper and will be presented elsewhere (Güdel et al. 2007, in preparation). Note that small manual corrections were necessary for DN Tau, DI Tau AB, and BP Tau (see footnote 5).

shows the OM FAST light curves together with the X-ray light curves. The classification type is also given on the upper right corner of each panel. The light curve of T Tau will be presented elsewhere (Güdel et al. 2007, in preparation). The OM FAST data of IT Tau and UZ Tau EW were not useful since the sources fell on or slightly outside the OM FAST window, and thus the light curves are not reliable. We also applied some manual cor-

rections to the OM FAST light curves of DN Tau, DI Tau, and BP Tau.⁵

⁵ In the case of DN Tau, due to a feature in SAS 6.x, about half the counts were processed in the exposure S009 (DATE-OBS='2005-03-05T01:37:35' and DATE-END='2005-03-05T02:02:35') only. The average count rate in this exposure is 37.7 ct s^{-1} , after correction for deadtime, aperture, and coincidence losses. The detected count rate for S009 is 32.2 ct s^{-1} (i.e., 1.17 times smaller), based on the theoretical

Focusing on the OM FAST light curves, it is clear that Type 3 stars show almost no variability in the OM, in contrast to Type 2 stars. The classical T Tau star BP Tau shows significant UV variability (the BP Tau data were originally presented by Schmitt et al. 2005). One large X-ray flare is visible at the start of the observation, with two slowly varying flux enhancements that could be due to flares, but also rotational modulation of bright active regions. The UVW1 light curve of BP Tau does not show direct evidence of correlations with the X-ray light curve. In fact, the UV flux peaks *after* the X-ray light curve, in contradiction with the Neupert effect paradigm. However, such a peculiar behavior is not uncommon in some flares observed in the Sun or in main-sequence or evolved magnetically active stars with no accretion (e.g., Ayres et al. 2001; Stelzer et al. 2003; Osten et al. 2005). Nevertheless, the strong variability in the OM light curve is generally uncorrelated with the X-ray light curve, which strongly suggests that the OM light curve is completely dominated by the UV emission of accretion spots in BP Tau. The period of BP Tau being 7.60 d, much longer than the 1.5 d duration of the observation or typical OM “events” (0.1–0.2 d), it is more probable that such events are due to accretion events such as those observed in the brown dwarf 2MASS J04141188+2811535 (Grosso et al. 2006a).

The GK Tau light curves deserve special attention. Indeed, the OM light curve shows evidence of two behaviors: a general slow variation uncorrelated with the X-ray light curve that is probably due to the rotational modulation of accretion spots ($P = 4.60$ d), and a short-duration event around JD 2453422.84 that appears related to a small flare-like event in the X-rays. Figure 9 shows an extract of the light curves. Note that the OM emission is from GK Tau A. The companion at 2'5 was not detected in the OM. In the X-rays, the binary cannot be resolved; nevertheless, the A component should contribute the most to the X-ray emission. In addition, the X-ray emission is blended with the X-ray emission of the nearby GI Tau. The X-ray light curves of GK Tau AB and GI Tau shown in this paper take into account this blend since they were extracted from smaller radii (160 pix, i.e., 8''). We convolved the OM light curve through the kernel function, $K(t, t')$, where $K(t, t') = e^{-(t-t')/\tau}$ if $t' < t$ and $K(t, t') = 0$ otherwise, and where τ was set to 2 ks; for clarity and comparison with the X-ray light curve, we introduced a vertical offset to the convolved light curve. The convolution of the OM light curve is similar to an integration; however, the use of the exponential function in the kernel allows us to mimic the decaying effect of radiative and conductive cooling in X-rays. This exercise is a good indication that the event observed in X-rays and in the OM in GK Tau is a flare that displayed a Neupert-

correction in the *XMM-Newton* Users Handbook (the empirical correction is minimal). In contrast, the average count rate in the preceding exposure (S408) is 87.7 ct s^{-1} . The latter corresponds to a detected count rate of 63.4 ct s^{-1} (i.e., 1.38 times smaller). Thus, we multiplied the count rates in S009 by $2/1.17 \times 1.38 = 2.36$ to correct for the SAS feature. For DI Tau, the pointing of the satellite changed unexpectedly after DATE-OBS='2005-02-09T19:30:13' (exposures S412, S009, S413-S416), and DI Tau fell just on the edge of the OM FAST window. We thus discarded count rates after this epoch. For BP Tau, a problem with the time stamps of exposure S051 occurred. The DATE-OBS and DATE-END keywords of the following exposure, S052, were incorrectly used, and thus the time stamps of events were incorrectly calculated by the SAS software. We manually corrected these time stamps and keywords by using the correct keywords, DATE-OBS='2004-08-16T06:45:56' DATE-END='2004-08-16T08:27:51', and incidentally shifting the time stamps by -6256 seconds. The same timing problem for the S051 IMAGING data of BP Tau needed a similar corrections of the date keywords.

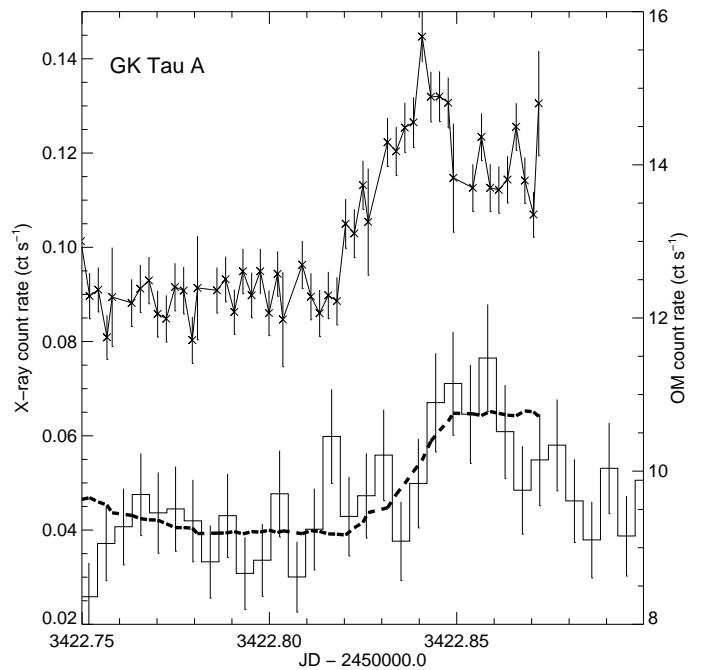


Fig. 9. Details of the GK Tau OM and X-ray light curves. The OM light curve (top curve) was rebinned to a bin size of 200 s, while the X-ray light curve (bottom histogram) used a 400 s bin size. The thick dashed line corresponds to the OM light curve convolved through a kernel $K(t, t')$ (see text) but it was shifted down for clarity. The GK Tau A event shows evidence of a Neupert-like effect.

like effect, with the optical emission peaking before the X-rays. A similar case is reported in DG Tau A with OM IMAGING data (Güdel et al. 2006b). GK Tau's OM light curve can, therefore, be seen as a combination of stellar photospheric emission, accretion spot emission producing slow variability, and flare-like events. As seen from GK Tau, but most visibly BP Tau (and other Type 2 stars), the long-term variability due to accretion does not appear to correlate with the X-ray variability in general. This indicates that the contribution of accretion to the X-ray emission is limited, probably to the soft component only, as suggested from high-resolution X-ray spectra of classical T Tau stars (Telleschi et al. 2006a). In contrast, Type 3 stars with little or no accretion do not show evidence of slow variability in the OM.

6. Summary and Conclusions

We have presented results from the Optical Monitor data of the *XMM-Newton* Extended Survey of the Taurus Molecular Cloud. Optical (U) or ultraviolet (UVW1 or UVW2) magnitudes were obtained; in addition low time resolution light curves from the IMAGING data were compiled and compared to the X-ray light curves. For a handful of sources, FAST mode data with high time resolution were available as well.

The OM data are unique since they provide strictly simultaneous coverage in the optical (or ultraviolet) together with X-rays. This *XMM-Newton* capability allowed us to study light curves; we were able to detect Neupert-like effects in the accreting stars GK Tau A and DG Tau A, but also slow variability in accreting stars that is most likely due to accretion spots. A statistical analysis shows that, although observed U magnitudes are similar in Type 2 and 3 stars, accreting stars are, in fact, brighter in the U band than Type 3 stars after correction for extinction. This excess emission most likely originates from

accretion. This behavior, although not a new discovery, is now shown to be disconnected from the X-ray variability. Indeed, for example, the light curve of BP Tau shows strong ultraviolet variability that is not reproduced in the X-ray light curve. In contrast, non-accreting stars (or stars with low accretion rates) do not show evidence of slow variability. Their emission is therefore probably dominated by photospheric emission. Similar results were found in the optical (*BVRI*) and X-ray data of Orion Nebula Cluster pre-main sequence stars (Stassun et al. 2006).

The XEST OM catalogue lists 2,148 detected sources and about 88 % (1893) OM sources had 2MASS counterparts; in contrast, 916 sources were detected in the X-rays and had coordinates such that they could be detected in the OM (not necessarily). However, only 98 X-ray sources matched OM sources, after astrometric corrections applied to both the X-rays and the OM coordinates based on 2MASS coordinates. And out of these 98 sources, only 51 are considered as TMC members (12 are bona-fide TMC candidates; Scelsi et al. 2006). Therefore, the vast majority (about 97 %) detected in the OM images are, in fact, not TMC members. While it is hard to determine the origin of a target based on X-rays or optical alone, the OM data, together with 2MASS and *Spitzer* data (Padgett et al. 2006, in preparation), should provide useful constraints to discriminate between stellar and non-stellar objects, and thus discover new members of the Taurus Molecular Cloud.

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Online Material

Appendix A: Full OM catalogue

Table A.1. XEST OM Catalogue

#	RA _{corr} h m s	δ_{corr} $^{\circ} \text{' } \text{''}$	Δ ($''$)	XEST OM	2MASS	ρ_1 ($''$)	XEST	ρ_2 ($''$)	Mag ^a	Signif.
1	04 03 59.95	+26 23 31.8	0.60	06-OM-001	04035989+2623319	0.73			20.62 ± 0.09	15.2
2	04 04 00.62	+26 24 43.9	0.60	06-OM-002	04040056+2624441	0.81			19.05 ± 0.04	21.4
3	04 04 00.78	+26 23 29.8	0.57	06-OM-003	04040075+2623295	0.45			16.79 ± 0.01	114.3
4	04 04 02.24	+26 24 59.7	0.57	06-OM-004	04040217+2624595	0.84			16.02 ± 0.00	176.6
5	04 04 03.27	+26 22 24.6	0.63	06-OM-005	04040327+2622244	0.13			19.95 ± 0.09	10.4
6	04 04 03.59	+26 25 02.8	0.60	06-OM-006					18.33 ± 0.03	38.5
7	04 04 04.69	+26 24 48.7	0.63	06-OM-007	04040467+2624478	0.84			20.15 ± 0.10	8.5
8	04 04 07.46	+26 19 10.4	0.61	06-OM-008	04040741+2619102	0.60			19.19 ± 0.04	19.6
9	04 04 08.17	+26 17 50.7	0.59	06-OM-009	04040814+2617508	0.33			18.38 ± 0.01	37.5
10	04 04 08.31	+26 19 18.6	0.63	06-OM-010					20.46 ± 0.17	6.2
11	04 04 08.43	+26 19 49.0	0.63	06-OM-011					20.15 ± 0.12	8.4
12	04 04 09.26	+26 19 10.1	0.61	06-OM-012	04040919+2619098	0.88			19.26 ± 0.12	18.1
13	04 04 09.35	+26 14 06.2	0.59	06-OM-013	04040936+2614059	0.32			18.65 ± 0.03	29.7
14	04 04 09.50	+26 15 16.7	0.64	06-OM-014					20.87 ± 0.08	4.4
15	04 04 09.57	+26 22 03.8	0.58	06-OM-015	04040952+2622034	0.62			17.38 ± 0.02	78.6
16	04 04 09.87	+26 19 00.6	0.64	06-OM-016					20.51 ± 0.16	6.0
17	04 04 10.24	+26 21 58.7	0.60	06-OM-017	04041018+2621581	0.98			18.94 ± 0.05	24.4
18	04 04 10.44	+26 22 57.3	0.64	06-OM-018					20.84 ± 0.14	4.7
19	04 04 10.53	+26 19 01.3	0.58	06-OM-019	04041051+2619011	0.33			17.67 ± 0.03	63.8
20	04 04 11.02	+26 10 57.7	0.61	06-OM-020	04041104+2610573	0.51			19.19 ± 0.06	19.6
21	04 04 11.19	+26 20 04.0	0.61	06-OM-021	04041116+2620036	0.50			19.57 ± 0.05	14.3
22	04 04 11.22	+26 10 47.7	0.63	06-OM-022					20.21 ± 0.19	7.7
23	04 04 11.34	+26 25 16.4	0.57	06-OM-023	04041129+2625162	0.65			16.77 ± 0.01	115.6
24	04 04 11.82	+26 11 41.1	0.64	06-OM-024					20.92 ± 0.17	4.1
25	04 04 11.83	+26 25 03.8	0.62	06-OM-025	04041178+2625035	0.64			19.62 ± 0.13	13.3
26	04 04 11.85	+26 12 03.2	0.62	06-OM-026					19.63 ± 0.09	13.5
27	04 04 11.89	+26 11 24.4	0.59	06-OM-027	04041191+2611239	0.58			18.59 ± 0.04	32.1
28	04 04 11.93	+26 19 12.0	0.60	06-OM-028	04041190+2619118	0.25			19.00 ± 0.05	22.8
29	04 04 12.66	+26 12 44.4	0.63	06-OM-029			06-029	2.86	20.13 ± 0.12	8.7
30	04 04 13.03	+26 11 41.6	0.58	06-OM-030	04041305+2611414	0.27			18.00 ± 0.02	50.3
31	04 04 13.31	+26 22 07.2	0.63	06-OM-031	04041331+2622067	0.42			20.27 ± 0.12	7.7
32	04 04 13.89	+26 11 19.5	0.61	06-OM-032	04041393+2611191	0.75			19.42 ± 0.11	15.8
33	04 04 13.96	+26 13 20.8	0.64	06-OM-033					20.74 ± 0.37	5.0
34	04 04 14.09	+26 17 33.0	0.60	06-OM-034	04041407+2617326	0.42			18.93 ± 0.07	24.2
35	04 04 14.21	+26 10 35.1	0.63	06-OM-035					20.58 ± 0.03	5.8
36	04 04 14.37	+26 17 12.9	0.64	06-OM-036					21.25 ± 0.59	3.2
37	04 04 14.77	+26 09 26.6	0.57	06-OM-037	04041480+2609264	0.52			16.94 ± 0.01	103.0
38	04 04 15.13	+26 12 49.4	0.62	06-OM-038	04041513+2612491	0.21			20.02 ± 0.11	9.4
39	04 04 15.19	+26 12 39.1	0.63	06-OM-039					20.01 ± 0.07	9.7
40	04 04 15.63	+26 09 38.7	0.63	06-OM-040					21.87 ± 0.55	3.4
41	04 04 15.67	+26 09 03.7	0.59	06-OM-041	04041570+2609036	0.43			18.48 ± 0.04	34.2
42	04 04 15.79	+26 20 44.4	0.60	06-OM-042	04041575+2620443	0.48			19.26 ± 0.11	18.2
43	04 04 15.98	+26 17 40.1	0.64	06-OM-043					20.61 ± 0.33	5.0
44	04 04 16.18	+26 15 29.3	0.63	06-OM-044					20.91 ± 0.20	4.1
45	04 04 16.37	+26 12 31.2	0.64	06-OM-045					21.33 ± 0.58	3.2
46	04 04 16.38	+26 20 34.8	0.63	06-OM-046	04041636+2620341	0.63			20.34 ± 0.18	7.0
47	04 04 16.72	+26 15 21.7	0.63	06-OM-047	04041671+2615213	0.34			20.02 ± 0.24	8.8
48	04 04 16.76	+26 20 01.0	0.61	06-OM-048	04041672+2620011	0.47			19.34 ± 0.10	17.1
49	04 04 16.84	+26 11 26.1	0.58	06-OM-049	04041684+2611258	0.27			17.38 ± 0.01	77.9
50	04 04 16.88	+26 12 41.1	0.57	06-OM-050	04041688+2612409	0.13			16.76 ± 0.01	115.6
51	04 04 17.10	+26 19 43.9	0.63	06-OM-051					20.40 ± 0.21	6.5
52	04 04 17.55	+26 15 31.1	0.63	06-OM-052					20.55 ± 0.23	5.5
53	04 04 17.92	+26 12 33.4	0.59	06-OM-053	04041792+2612332	0.21			18.69 ± 0.04	29.4
54	04 04 17.97	+26 12 17.8	0.63	06-OM-054	04041797+2612173	0.49			20.53 ± 0.24	5.8
55	04 04 18.12	+26 22 21.6	0.60	06-OM-055	04041807+2622210	0.79			19.03 ± 0.09	23.3
56	04 04 18.68	+26 10 15.1	0.60	06-OM-056	04041872+2610154	0.68			18.89 ± 0.04	25.1
57	04 04 18.85	+26 11 24.5	0.57	06-OM-057	04041886+2611244	0.18			16.12 ± 0.00	167.9
58	04 04 19.08	+26 25 06.7	0.61	06-OM-058	04041901+2625062	0.91			19.52 ± 0.13	14.7

Table A.1. (Continued)

#	RA _{corr} h m s	δ _{corr} °, ′, ″	Δ (")	XEST OM	2MASS	ρ ₁ (")	XEST	ρ ₂ (")	Mag	Signif.
59	04 04 19.10	+26 10 59.7	0.63	06-OM-059					20.13 ± 0.10	8.6
60	04 04 19.21	+26 10 07.9	0.60	06-OM-060	04041924+2610081	0.48			19.00 ± 0.07	22.8
61	04 04 19.34	+26 25 36.5	0.64	06-OM-061	04041932+2625362	0.32			20.82 ± 0.26	4.3
62	04 04 19.94	+26 25 51.8	0.57	06-OM-062	04041989+2625514	0.67			17.03 ± 0.00	98.7
63	04 04 20.31	+26 09 02.8	0.59	06-OM-063					19.34 ± 0.04	23.1
64	04 04 20.79	+26 17 37.9	0.64	06-OM-064	04042076+2617384	0.64			20.68 ± 0.38	4.5
65	04 04 21.01	+26 25 45.7	0.60	06-OM-065	04042099+2625452	0.46			19.22 ± 0.06	19.3
66	04 04 21.29	+26 24 17.8	0.64	06-OM-066					20.97 ± 0.16	4.0
67	04 04 21.49	+26 10 09.1	0.58	06-OM-067	04042152+2610091	0.49			18.12 ± 0.03	46.2
68	04 04 21.62	+26 19 13.5	0.62	06-OM-068	04042159+2619134	0.41			19.85 ± 0.14	10.8
69	04 04 22.30	+26 21 48.7	0.58	06-OM-069	04042226+2621483	0.58			17.78 ± 0.02	59.2
70	04 04 22.58	+26 12 42.6	0.57	06-OM-070	04042257+2612423	0.27			17.10 ± 0.01	93.2
71	04 04 22.73	+26 21 31.2	0.62	06-OM-071	04042273+2621314	0.28			19.69 ± 0.02	13.0
72	04 04 22.83	+26 10 41.9	0.63	06-OM-072					20.86 ± 0.45	4.2
73	04 04 22.92	+26 23 47.5	0.63	06-OM-073	04042292+2623466	0.86			19.91 ± 0.09	10.6
74	04 04 22.94	+26 17 27.4	0.63	06-OM-074	04042299+2617267	1.00			20.64 ± 0.17	5.3
75	04 04 23.05	+26 26 14.8	0.58	06-OM-075	04042303+2626144	0.36			19.26 ± 0.03	34.8
76	04 04 23.24	+26 17 53.9	0.58	06-OM-076	04042321+2617536	0.46			18.16 ± 0.05	44.2
77	04 04 23.24	+26 11 11.1	0.57	06-OM-077	04042325+2611108	0.36			12.99 ± 0.14	770.1
78	04 04 23.63	+26 12 24.2	0.57	06-OM-078	04042362+2612238	0.34			15.77 ± 0.05	202.2
79	04 04 24.45	+26 11 12.0	0.59	06-OM-079	04042449+2611119	0.61	06-041	0.99	18.02 ± 0.05	43.2
80	04 04 24.88	+26 18 43.2	0.59	06-OM-080	04042486+2618434	0.30			18.41 ± 0.02	36.4
81	04 04 25.21	+26 15 13.6	0.62	06-OM-081					19.87 ± 0.07	10.8
82	04 04 25.23	+26 12 07.2	0.62	06-OM-082					20.05 ± 0.04	9.3
83	04 04 25.55	+26 25 10.0	0.64	06-OM-083	04042553+2625089	1.14			20.86 ± 0.11	4.6
84	04 04 25.64	+26 15 29.0	0.63	06-OM-084	04042574+2615287	1.47			20.56 ± 0.10	5.8
85	04 04 25.75	+26 18 47.2	0.63	06-OM-085					19.96 ± 0.12	9.8
86	04 04 25.78	+26 11 45.4	0.61	06-OM-086					19.68 ± 0.07	12.6
87	04 04 25.88	+26 25 02.8	0.64	06-OM-087					20.63 ± 0.32	5.8
88	04 04 26.20	+26 14 22.2	0.62	06-OM-088	04042624+2614219	0.62			19.65 ± 0.09	13.1
89	04 04 26.30	+26 21 12.0	0.59	06-OM-089	04042626+2621115	0.67			18.66 ± 0.03	30.3
90	04 04 26.33	+26 17 00.4	0.64	06-OM-090					20.75 ± 0.10	4.9
91	04 04 26.40	+26 16 07.6	0.58	06-OM-091	04042640+2616078	0.25			17.29 ± 0.01	82.5
92	04 04 26.52	+26 10 41.6	0.63	06-OM-092	04042655+2610409	0.83			19.97 ± 0.05	10.0
93	04 04 26.64	+26 09 09.8	0.63	06-OM-093	04042669+2609094	0.90			20.68 ± 0.08	5.3
94	04 04 27.21	+26 11 31.4	0.63	06-OM-094					20.01 ± 0.29	8.4
95	04 04 27.21	+26 11 46.1	0.58	06-OM-095	04042721+2611457	0.39			17.80 ± 0.08	59.1
96	04 04 27.46	+26 23 39.7	0.59	06-OM-096	04042743+2623394	0.37			18.78 ± 0.02	28.0
97	04 04 28.20	+26 26 01.2	0.57	06-OM-097	04042818+2626011	0.13			16.87 ± 0.01	109.2
98	04 04 28.37	+26 11 25.3	0.62	06-OM-098	04042837+2611252	0.16			20.35 ± 0.05	7.1
99	04 04 28.40	+26 16 56.1	0.59	06-OM-099	04042840+2616562	0.24			18.39 ± 0.03	37.0
100	04 04 28.58	+26 25 30.7	0.58	06-OM-100	04042857+2625307	0.08			18.27 ± 0.01	41.7
101	04 04 28.80	+26 12 01.1	0.58	06-OM-101	04042879+2612007	0.37			17.98 ± 0.02	51.5
102	04 04 28.83	+26 24 02.3	0.63	06-OM-102	04042882+2624022	0.08			20.12 ± 0.16	8.6
103	04 04 29.11	+26 16 00.8	0.63	06-OM-103					20.62 ± 0.06	5.5
104	04 04 29.26	+26 11 28.0	0.64	06-OM-104					20.44 ± 0.11	6.7
105	04 04 29.45	+26 09 30.6	0.63	06-OM-105					20.01 ± 0.08	9.7
106	04 04 29.59	+26 25 38.2	0.63	06-OM-106	04042962+2625376	0.69			20.37 ± 0.15	7.0
107	04 04 29.65	+26 11 33.2	0.62	06-OM-107	04042961+2611336	0.66			19.79 ± 0.02	11.7
108	04 04 29.95	+26 24 36.5	0.59	06-OM-108	04042991+2624366	0.38			18.72 ± 0.03	29.4
109	04 04 30.34	+26 24 12.5	0.64	06-OM-109					20.95 ± 0.06	4.3
110	04 04 30.35	+26 09 31.2	0.57	06-OM-110	04043037+2609314	0.44			16.09 ± 0.00	171.2
111	04 04 30.36	+26 22 11.0	0.60	06-OM-111	04043035+2622113	0.33			19.21 ± 0.06	19.5
112	04 04 30.51	+26 10 25.3	0.64	06-OM-112					20.65 ± 0.16	5.4
113	04 04 30.58	+26 21 56.5	0.64	06-OM-113					20.87 ± 0.40	4.6
114	04 04 30.96	+26 15 25.2	0.61	06-OM-114					19.51 ± 0.12	14.4
115	04 04 31.19	+26 12 31.3	0.59	06-OM-115	04043118+2612308	0.44			18.35 ± 0.02	38.8
116	04 04 31.19	+26 16 09.4	0.61	06-OM-116					19.38 ± 0.09	16.3

Table A.1. (Continued)

#	RA _{corr} h m s	δ_{corr} $^{\circ}, ^{\prime}, ^{\prime\prime}$	Δ ($''$)	XEST OM	2MASS	ρ_1 ($''$)	XEST	ρ_2 ($''$)	Mag	Signif.
117	04 04 31.20	+26 16 38.6	0.58	06-OM-117	04043119+2616388	0.22			17.42 ± 0.02	75.0
118	04 04 31.23	+26 09 39.1	0.64	06-OM-118					20.92 ± 0.16	4.2
119	04 04 31.60	+26 20 22.1	0.61	06-OM-119	04043162+2620222	0.36			19.28 ± 0.03	18.2
120	04 04 31.93	+26 18 30.5	0.61	06-OM-120					19.63 ± 0.04	13.4
121	04 04 32.06	+26 12 42.3	0.63	06-OM-121					20.39 ± 0.13	6.7
122	04 04 32.11	+26 19 56.7	0.63	06-OM-122					20.60 ± 0.19	5.4
123	04 04 32.98	+26 11 33.4	0.58	06-OM-123	04043297+2611333	0.11			17.60 ± 0.01	66.9
124	04 04 33.01	+26 10 01.2	0.64	06-OM-124					20.44 ± 0.20	6.1
125	04 04 33.26	+26 19 58.7	0.60	06-OM-125	04043324+2619581	0.55			19.00 ± 0.02	22.8
126	04 04 33.92	+26 16 10.8	0.59	06-OM-126	04043392+2616109	0.22			18.33 ± 0.02	38.2
127	04 04 34.24	+26 15 03.7	0.57	06-OM-127	04043423+2615038	0.16			16.24 ± 0.00	155.6
128	04 04 34.54	+26 12 47.4	0.64	06-OM-128	04043459+2612473	0.76	06-048	1.42	20.55 ± 0.00	6.0
129	04 04 34.55	+26 12 32.4	0.63	06-OM-129					20.04 ± 0.12	9.1
130	04 04 34.69	+26 22 54.7	0.58	06-OM-130	04043466+2622544	0.42			18.27 ± 0.02	41.7
131	04 04 34.91	+26 12 21.1	0.57	06-OM-131	04043490+2612210	0.09			15.48 ± 0.00	236.8
132	04 04 34.91	+26 11 05.5	0.57	06-OM-132	04043491+2611053	0.17			17.24 ± 0.02	85.5
133	04 04 35.46	+26 09 51.9	0.63	06-OM-133					20.73 ± 0.18	5.0
134	04 04 35.55	+26 18 03.3	0.60	06-OM-134	04043556+2618031	0.27			18.95 ± 0.05	22.0
135	04 04 35.98	+26 18 54.7	0.59	06-OM-135	04043600+2618548	0.37			18.77 ± 0.08	25.9
136	04 04 37.06	+26 12 16.4	0.59	06-OM-136	04043707+2612163	0.22			18.54 ± 0.02	33.1
137	04 04 37.57	+26 12 00.8	0.61	06-OM-137	04043761+2612005	0.71			19.47 ± 0.05	15.4
138	04 04 37.67	+26 11 20.7	0.64	06-OM-138					20.90 ± 0.01	4.4
139	04 04 37.78	+26 11 45.3	0.58	06-OM-139	04043780+2611451	0.37			18.38 ± 0.01	37.7
140	04 04 38.75	+26 16 49.2	0.58	06-OM-140	04043874+2616495	0.33			18.17 ± 0.02	42.2
141	04 04 38.83	+26 24 13.2	0.57	06-OM-141	04043878+2624133	0.52			12.97 ± 0.00	798.1
142	04 04 38.91	+26 22 34.8	0.63	06-OM-142	04043889+2622349	0.34			20.17 ± 0.12	8.5
143	04 04 39.04	+26 12 28.1	0.61	06-OM-143					19.46 ± 0.10	15.5
144	04 04 40.09	+26 13 09.7	0.61	06-OM-144					19.61 ± 0.02	13.9
145	04 04 41.38	+26 12 09.0	0.64	06-OM-145					20.93 ± 0.18	4.0
146	04 04 42.55	+26 16 58.2	0.62	06-OM-146					20.75 ± 0.05	4.5
147	04 04 42.56	+26 15 11.5	0.64	06-OM-147	04044256+2615113	0.11			20.76 ± 0.23	4.6
148	04 04 43.09	+26 25 53.0	0.63	06-OM-148	04044307+2625535	0.61			20.53 ± 0.21	5.8
149	04 04 43.73	+26 13 07.9	0.63	06-OM-149	04044372+2613079	0.16			20.15 ± 0.22	7.8
150	04 04 44.42	+26 24 47.1	0.58	06-OM-150	04044439+2624472	0.44			18.05 ± 0.04	48.6
151	04 04 44.50	+26 13 47.4	0.63	06-OM-151					20.56 ± 0.20	5.5
152	04 04 45.16	+26 13 32.5	0.61	06-OM-152					19.51 ± 0.09	14.8
153	04 04 46.56	+26 12 01.8	0.57	06-OM-153	04044651+2612019	0.61			12.70 ± 0.14	890.4
154	04 04 46.66	+26 11 25.8	0.61	06-OM-154					19.40 ± 0.09	15.7
155	04 04 46.76	+26 12 02.9	0.60	06-OM-155					12.17 ± 0.06	1064.3
156	04 04 47.12	+26 26 06.0	0.64	06-OM-156	04044712+2626061	0.22			20.50 ± 0.15	6.3
157	04 04 47.19	+26 10 17.6	0.63	06-OM-157					21.13 ± 0.18	3.4
158	04 04 47.27	+26 10 43.2	0.60	06-OM-158					18.31 ± 0.18	35.3
159	04 04 47.45	+26 13 44.6	0.63	06-OM-159					20.78 ± 0.10	4.9
160	04 04 48.05	+26 11 24.0	0.62	06-OM-160					20.14 ± 0.12	8.2
161	04 04 48.37	+26 13 59.2	0.63	06-OM-161					20.20 ± 0.09	8.2
162	04 04 48.75	+26 11 05.6	0.61	06-OM-162	04044875+2611059	0.30			19.65 ± 0.10	12.8
163	04 04 48.82	+26 12 27.5	0.61	06-OM-163					19.76 ± 0.21	10.3
164	04 04 49.31	+26 10 47.5	0.58	06-OM-164	04044932+2610476	0.27			17.68 ± 0.02	61.6
165	04 04 49.42	+26 14 38.2	0.57	06-OM-165	04044941+2614383	0.19			17.21 ± 0.01	87.7
166	04 04 49.59	+26 13 05.3	0.64	06-OM-166	04044959+2613049	0.37			20.65 ± 0.33	5.5
167	04 04 50.65	+26 15 20.8	0.64	06-OM-167					20.61 ± 0.29	5.3
168	04 04 50.94	+26 11 29.4	0.57	06-OM-168	04045095+2611295	0.25			15.87 ± 0.00	191.8
169	04 04 51.03	+26 11 58.6	0.63	06-OM-169					20.43 ± 0.28	6.6
170	04 04 51.27	+26 11 01.3	0.62	06-OM-170	04045123+2611020	0.86			20.24 ± 0.10	7.7
171	04 04 51.56	+26 12 28.3	0.57	06-OM-171	04045157+2612285	0.30			16.42 ± 0.01	140.5
172	04 04 51.82	+26 10 33.9	0.64	06-OM-172					21.27 ± 0.58	3.2
173	04 04 51.97	+26 27 29.7	0.59	06-OM-173	04045193+2627297	0.41			18.43 ± 0.04	37.1
174	04 04 52.95	+26 14 56.9	0.61	06-OM-174					19.34 ± 0.02	17.5

Table A.1. (Continued)

#	RA _{corr} h m s	δ _{corr} ° ′ ″	Δ (")	XEST OM	2MASS	ρ ₁ (")	XEST	ρ ₂ (")	Mag	Signif.
175	04 04 53.01	+26 14 46.9	0.57	06-OM-175	04045300+2614469	0.18			16.96 ± 0.01	102.7
176	04 04 53.16	+26 15 28.0	0.64	06-OM-176	04045316+2615281	0.19			20.82 ± 0.17	4.6
177	04 04 53.41	+26 24 51.6	0.63	06-OM-177	04045338+2624512	0.50			20.31 ± 0.11	7.4
178	04 04 53.64	+26 13 13.0	0.62	06-OM-178	04045366+2613131	0.34			19.90 ± 0.13	10.4
179	04 04 54.45	+26 12 35.1	0.63	06-OM-179	04045445+2612349	0.19			20.41 ± 0.13	6.5
180	04 04 54.84	+26 15 44.1	0.64	06-OM-180	04045482+2615439	0.26			21.00 ± 0.03	4.1
181	04 04 54.86	+26 13 56.8	0.64	06-OM-181	04045488+2613574	0.63			21.23 ± 0.10	3.3
182	04 04 55.45	+26 12 04.0	0.58	06-OM-182					17.78 ± 0.01	57.8
183	04 04 55.53	+26 13 30.3	0.59	06-OM-183	04045555+2613308	0.59			18.42 ± 0.02	37.0
184	04 04 55.64	+26 23 58.1	0.58	06-OM-184	04045561+2623588	0.80			17.46 ± 0.00	74.0
185	04 04 55.64	+26 12 51.6	0.59	06-OM-185	04045567+2612518	0.52			18.68 ± 0.03	29.5
186	04 04 56.12	+26 12 46.3	0.58	06-OM-186	04045611+2612470	0.79			19.47 ± 0.12	30.2
187	04 04 56.13	+26 27 38.5	0.64	06-OM-187	04045616+2627375	1.11			20.52 ± 0.24	5.9
188	04 04 56.19	+26 15 31.8	0.58	06-OM-188	04045621+2615317	0.27			18.13 ± 0.03	46.0
189	04 04 56.67	+26 15 00.5	0.62	06-OM-189	04045666+2615002	0.30			20.05 ± 0.10	9.4
190	04 04 56.82	+26 24 49.7	0.61	06-OM-190	04045679+2624498	0.39			19.64 ± 0.06	13.6
191	04 04 57.09	+26 22 58.3	0.62	06-OM-191	04045710+2622582	0.18			20.01 ± 0.10	9.6
192	04 04 57.19	+26 24 32.6	0.64	06-OM-192	04045726+2624327	1.02			20.49 ± 0.38	5.4
193	04 04 57.24	+26 14 25.0	0.59	06-OM-193	04045718+2614255	0.87			18.61 ± 0.01	31.9
194	04 04 57.25	+26 10 36.8	0.60	06-OM-194					19.13 ± 0.07	20.6
195	04 04 57.60	+26 23 03.7	0.64	06-OM-195					21.28 ± 0.59	3.2
196	04 04 58.16	+26 10 52.5	0.57	06-OM-196	04045818+2610528	0.54			15.90 ± 0.01	189.4
197	04 04 58.29	+26 26 32.9	0.57	06-OM-197	04045825+2626328	0.53			15.60 ± 0.01	223.4
198	04 04 58.32	+26 12 10.6	0.58	06-OM-198	04045836+2612106	0.57			18.00 ± 0.01	50.1
199	04 04 59.13	+26 26 03.0	0.63	06-OM-199					20.45 ± 0.17	6.4
200	04 04 59.27	+26 16 38.1	0.63	06-OM-200	04045926+2616376	0.38			20.17 ± 0.17	8.2
201	04 04 59.28	+26 15 26.8	0.58	06-OM-201	04045928+2615268	0.05			17.81 ± 0.02	58.1
202	04 04 59.32	+26 12 20.5	0.61	06-OM-202					19.63 ± 0.03	13.7
203	04 04 59.63	+26 14 14.2	0.64	06-OM-203					20.23 ± 0.11	8.0
204	04 04 59.98	+26 14 38.6	0.62	06-OM-204			06-075	0.98	19.46 ± 0.06	15.9
205	04 05 00.11	+26 14 21.3	0.64	06-OM-205					20.36 ± 0.03	7.2
206	04 05 00.12	+26 26 55.6	0.58	06-OM-206	04050008+2626556	0.48			17.47 ± 0.01	74.3
207	04 05 00.39	+26 14 40.5	0.63	06-OM-207					19.56 ± 0.17	13.8
208	04 05 00.54	+26 16 12.7	0.60	06-OM-208	04050053+2616123	0.38			18.98 ± 0.06	23.8
209	04 05 00.62	+26 24 42.0	0.61	06-OM-209	04050059+2624428	0.95			19.23 ± 0.05	19.3
210	04 05 00.98	+26 21 22.3	0.63	06-OM-210	04050104+2621223	0.87			20.19 ± 0.06	8.3
211	04 05 01.73	+26 12 11.1	0.58	06-OM-211	04050174+2612111	0.20			18.15 ± 0.01	45.6
212	04 05 01.75	+26 23 29.0	0.62	06-OM-212	04050179+2623298	0.98			19.76 ± 0.04	12.1
213	04 05 01.93	+26 18 09.9	0.60	06-OM-213	04050192+2618099	0.14			19.18 ± 0.03	20.1
214	04 05 02.04	+26 22 21.2	0.59	06-OM-214					18.49 ± 0.04	34.8
215	04 05 02.13	+26 11 11.0	0.58	06-OM-215	04050213+2611112	0.32			17.96 ± 0.02	52.8
216	04 05 02.17	+26 26 43.4	0.59	06-OM-216	04050210+2626434	0.82			18.62 ± 0.04	31.9
217	04 05 02.42	+26 19 24.9	0.60	06-OM-217	04050240+2619245	0.48			18.97 ± 0.03	23.8
218	04 05 02.45	+26 12 47.7	0.59	06-OM-218	04050231+2612486	2.15			18.62 ± 0.02	31.7
219	04 05 02.57	+26 21 27.6	0.60	06-OM-219					18.93 ± 0.04	24.6
220	04 05 02.59	+26 22 56.2	0.64	06-OM-220	04050255+2622571	1.04			20.84 ± 0.39	4.7
221	04 05 02.68	+26 27 01.0	0.63	06-OM-221					20.48 ± 0.34	5.5
222	04 05 02.91	+26 23 19.1	0.61	06-OM-222	04050293+2623200	1.06			19.38 ± 0.02	16.9
223	04 05 02.91	+26 14 28.6	0.63	06-OM-223					20.17 ± 0.06	8.3
224	04 05 02.98	+26 14 59.8	0.64	06-OM-224					20.82 ± 0.39	4.8
225	04 05 03.18	+26 16 31.2	0.57	06-OM-225	04050317+2616314	0.21			15.18 ± 0.00	276.3
226	04 05 03.21	+26 27 28.4	0.60	06-OM-226	04050316+2627284	0.48			19.18 ± 0.03	19.8
227	04 05 03.54	+26 19 48.1	0.59	06-OM-227	04050353+2619484	0.36			18.42 ± 0.02	37.0
228	04 05 03.54	+26 22 17.1	0.64	06-OM-228	04050353+2622177	0.58			20.92 ± 0.14	4.2
229	04 05 03.55	+26 15 16.9	0.64	06-OM-229					20.89 ± 0.42	4.5
230	04 05 03.83	+26 18 46.5	0.59	06-OM-230	04050383+2618466	0.19			18.92 ± 0.02	25.0
231	04 05 03.99	+26 14 56.0	0.64	06-OM-231					20.61 ± 0.23	5.1
232	04 05 04.07	+26 14 25.1	0.63	06-OM-232	04050409+2614248	0.47			20.39 ± 0.11	6.8

Table A.1. (Continued)

#	RA _{corr} h m s	δ_{corr} $^{\circ}, ^{\prime}, ^{\prime\prime}$	Δ ($''$)	XEST OM	2MASS	ρ_1 ($''$)	XEST	ρ_2 ($''$)	Mag	Signif.
813	04 29 38.71	+24 35 53.6	0.91	13-OM-004	04293874+2435525	1.20			21.26 ± 0.61	3.0
814	04 29 38.80	+26 31 19.2	0.82	15-OM-100	04293875+2631191	0.62			19.27 ± 0.12	9.6
815	04 29 38.85	+24 41 42.1	0.89	13-OM-005	04293882+2441422	0.36			19.17 ± 0.04	17.5
816	04 29 38.92	+26 28 59.1	0.77	15-OM-101	04293898+2628592	0.91			18.74 ± 0.11	15.6
817	04 29 38.97	+26 35 51.4	0.91	15-OM-102	04293899+2635510	0.44			20.27 ± 0.20	3.9
818	04 29 38.97	+26 37 20.2	0.90	15-OM-103	04293903+2637206	0.91			20.25 ± 0.02	4.3
819	04 29 39.23	+26 37 43.8	0.87	15-OM-104	04293931+2637437	1.12			19.85 ± 0.06	5.9
820	04 29 39.77	+26 36 43.9	0.88	15-OM-105	04293969+2636434	1.10			19.94 ± 0.16	5.3
821	04 29 39.83	+26 33 05.4	0.88	15-OM-106	04293984+2633054	0.17			20.42 ± 0.58	3.2
822	04 29 39.87	+26 27 19.9	0.83	15-OM-107	04293988+2627200	0.26			19.21 ± 0.04	10.4
823	04 29 40.07	+26 27 43.2	0.86	15-OM-108	04294002+2627433	0.61			19.68 ± 0.25	6.4
824	04 29 40.54	+26 39 20.9	0.90	15-OM-109	04294060+2639207	0.88			20.61 ± 0.00	3.1
825	04 29 40.85	+24 38 48.9	0.90	13-OM-006	04294083+2438484	0.43			19.98 ± 0.13	8.5
826	04 29 41.43	+26 36 46.6	0.90	15-OM-110	04294141+2636471	0.60			20.22 ± 0.13	4.2
827	04 29 41.57	+26 37 27.2	0.89	15-OM-111	04294157+2637266	0.56			20.13 ± 0.12	4.6
828	04 29 41.59	+26 32 58.0	0.71	15-OM-112	04294155+2632582	0.46	15-040	1.40	14.79 ± 0.04	168.8
829	04 29 42.09	+26 35 32.8	0.88	15-OM-113	04294207+2635332	0.47			19.97 ± 0.21	4.6
830	04 29 42.24	+26 33 34.0	1.05	15-OM-114					19.84 ± 0.19	4.4
831	04 29 42.34	+26 37 55.3	0.86	15-OM-115	04294236+2637553	0.37			19.72 ± 0.13	6.5
832	04 29 42.35	+26 35 06.4	0.83	15-OM-116	04294234+2635062	0.19			19.40 ± 0.17	7.5
833	04 29 42.41	+26 32 32.2	0.97	15-OM-117	04294241+2632330	0.86			20.10 ± 0.20	4.1
834	04 29 42.52	+26 32 49.1	0.72	15-OM-118	04294247+2632493	0.59	15-042	0.97	15.99 ± 0.01	89.8
835	04 29 42.60	+26 37 20.9	0.85	15-OM-119	04294264+2637202	0.82			19.60 ± 0.16	7.0
836	04 29 43.37	+26 28 40.7	0.92	15-OM-120	04294329+2628405	1.01			20.06 ± 0.31	4.6
837	04 29 43.70	+26 39 28.6	0.75	15-OM-121	04294375+2639282	0.79			18.11 ± 0.04	24.2
838	04 29 43.71	+24 41 09.7	0.90	13-OM-007	04294371+2441091	0.56			20.23 ± 0.06	7.9
839	04 29 43.98	+24 43 01.5	0.90	13-OM-008	04294398+2443018	0.34			20.09 ± 0.16	7.9
840	04 29 44.11	+24 40 50.2	0.91	13-OM-009	04294418+2440485	1.91			21.06 ± 0.04	3.7
841	04 29 44.13	+24 38 44.5	0.90	13-OM-010	04294411+2438446	0.19			20.28 ± 0.14	7.2
842	04 29 44.18	+26 25 24.1	0.91	15-OM-122	04294421+2625238	0.58			20.46 ± 0.11	3.6
843	04 29 44.45	+26 35 18.7	0.88	15-OM-123	04294443+2635178	0.82			19.95 ± 0.25	4.5
844	04 29 44.58	+26 38 32.9	0.79	15-OM-124	04294462+2638327	0.68			18.93 ± 0.07	12.8
845	04 29 44.77	+26 39 11.8	0.73	15-OM-125	04294483+2639116	0.80			17.63 ± 0.04	33.9
846	04 29 45.52	+26 38 38.7	0.81	15-OM-126	04294558+2638384	0.91			19.08 ± 0.10	11.2
847	04 29 45.54	+24 38 03.2	0.87	13-OM-011	04294552+2438030	0.24			17.75 ± 0.01	53.0
848	04 29 45.72	+26 36 47.8	0.80	15-OM-127	04294571+2636474	0.38			19.03 ± 0.16	11.4
849	04 29 46.05	+26 30 09.3	0.89	15-OM-128	04294606+2630094	0.31			20.03 ± 0.17	4.9
850	04 29 47.02	+26 38 35.3	0.92	15-OM-129	04294704+2638348	0.52			20.46 ± 0.01	3.5
851	04 29 47.06	+26 29 27.8	0.92	15-OM-130	04294710+2629274	0.72	15-047	2.99	20.47 ± 0.53	3.5
852	04 29 47.17	+26 31 32.4	0.90	15-OM-131	04294717+2631334	1.07			20.14 ± 0.26	4.2
853	04 29 47.65	+24 40 52.2	0.96	13-OM-012	04294780+2440517	2.14			19.25 ± 0.16	10.8
854	04 29 47.71	+26 27 01.5	0.91	15-OM-132	04294764+2627017	0.91			20.21 ± 0.20	4.2
855	04 29 47.76	+26 25 35.1	0.89	15-OM-133	04294776+2625353	0.25			20.16 ± 0.05	4.7
856	04 29 48.01	+26 37 45.6	0.91	15-OM-134	04294809+2637459	1.22			20.52 ± 0.54	3.5
857	04 29 48.08	+24 40 53.7	0.88	13-OM-013	04294810+2440537	0.30			18.71 ± 0.06	25.7
858	04 29 48.09	+26 27 56.1	0.87	15-OM-135	04294804+2627557	0.76			19.63 ± 0.07	7.4
859	04 29 48.33	+24 44 33.3	0.90	13-OM-014	04294832+2444334	0.10			19.72 ± 0.06	11.2
860	04 29 48.79	+26 25 22.7	0.85	15-OM-136	04294876+2625222	0.65			19.76 ± 0.29	5.9
861	04 29 48.89	+26 40 16.5	0.84	15-OM-137	04294891+2640163	0.46			19.46 ± 0.15	8.0
862	04 29 48.90	+26 25 33.2	0.80	15-OM-138	04294887+2625335	0.43			19.07 ± 0.07	11.8
863	04 29 49.56	+24 39 56.9	0.90	13-OM-015	04294971+2439563	2.21			20.82 ± 0.40	4.6
864	04 29 49.80	+26 34 47.3	0.88	15-OM-139	04294969+2634472	1.29			19.79 ± 0.28	5.3
865	04 29 49.82	+26 35 58.6	0.89	15-OM-140	04294986+2635589	0.61			20.39 ± 0.49	3.8
866	04 29 49.85	+26 27 48.0	0.80	15-OM-141	04294982+2627482	0.41			18.91 ± 0.08	13.2
867	04 29 49.88	+24 35 00.8	0.88	13-OM-016	04294987+2435007	0.06			18.79 ± 0.05	21.4
868	04 29 50.06	+26 33 25.3	0.85	15-OM-142	04295003+2633253	0.31			19.62 ± 0.07	6.7
869	04 29 50.26	+26 35 03.8	0.90	15-OM-143	04295021+2635039	0.54			20.26 ± 0.46	4.0
870	04 29 50.38	+24 40 56.4	0.91	13-OM-017	04295031+2440563	0.79			20.53 ± 0.22	5.3

Table A.1. (Continued)

#	RA _{corr} h m s	δ_{corr} $^{\circ}, ^{\prime}, ^{\prime\prime}$	Δ ($''$)	XEST OM	2MASS	ρ_1 ($''$)	XEST	ρ_2 ($''$)	Mag	Signif.
871	04 29 50.51	+24 41 40.5	0.90	13-OM-018	04295048+2441404	0.44			19.56 ± 0.14	12.5
872	04 29 50.76	+26 36 33.3	0.72	15-OM-144	04295075+2636329	0.41			16.42 ± 0.00	72.5
873	04 29 51.00	+24 43 04.1	0.87	13-OM-019	04295097+2443044	0.58			18.18 ± 0.03	39.0
874	04 29 51.24	+26 27 40.6	0.89	15-OM-145	04295134+2627406	1.44			20.16 ± 0.05	4.6
875	04 29 51.44	+26 34 45.1	0.90	15-OM-146					20.33 ± 0.46	4.0
876	04 29 51.65	+24 40 20.2	0.88	13-OM-020	04295163+2440201	0.27			18.84 ± 0.04	23.3
877	04 29 51.94	+26 40 09.6	0.72	15-OM-147	04295198+2640093	0.70			16.57 ± 0.02	66.5
878	04 29 52.01	+26 35 09.9	0.90	15-OM-148	04295208+2635099	0.89			20.29 ± 0.17	3.9
879	04 29 52.04	+26 08 35.5	0.74	14-OM-001	04295203+2608356	0.22			20.26 ± 0.25	6.9
880	04 29 52.35	+26 34 13.2	0.89	15-OM-149	04295238+2634136	0.56			20.24 ± 0.18	4.0
881	04 29 52.40	+24 42 09.4	0.87	13-OM-021	04295237+2442096	0.45			17.77 ± 0.04	52.4
882	04 29 52.56	+26 08 45.8	0.69	14-OM-002	04295253+2608450	0.87			18.04 ± 0.02	48.0
883	04 29 52.75	+26 41 00.6	0.85	15-OM-150	04295277+2641005	0.32			19.52 ± 0.13	7.5
884	04 29 52.81	+26 38 17.8	0.89	15-OM-151	04295282+2638170	0.83			20.18 ± 0.14	4.3
885	04 29 52.92	+26 33 15.5	0.87	15-OM-152	04295289+2633153	0.31			19.92 ± 0.23	5.1
886	04 29 53.20	+26 34 48.1	0.89	15-OM-153	04295315+2634478	0.74			20.16 ± 0.10	4.4
887	04 29 53.22	+26 07 13.8	0.72	14-OM-003	04295320+2607137	0.29			19.91 ± 0.08	10.6
888	04 29 53.23	+26 06 26.1	0.70	14-OM-004	04295322+2606255	0.58			20.21 ± 0.06	20.9
889	04 29 53.24	+26 33 54.1	0.89	15-OM-154	04295324+2633540	0.18			19.94 ± 0.32	4.8
890	04 29 53.34	+26 41 17.7	0.81	15-OM-155	04295337+2641173	0.63			18.78 ± 0.10	14.2
891	04 29 53.37	+26 26 21.2	0.76	15-OM-156	04295336+2626215	0.37			18.39 ± 0.11	19.8
892	04 29 53.46	+26 41 11.7	0.83	15-OM-157	04295350+2641115	0.56			18.96 ± 0.16	12.0
893	04 29 53.72	+26 38 29.8	0.87	15-OM-158	04295377+2638304	0.96			20.28 ± 0.15	3.9
894	04 29 53.76	+24 33 27.0	0.90	13-OM-022	04295380+2433269	0.63			20.20 ± 0.33	6.7
895	04 29 53.93	+26 27 53.9	0.87	15-OM-159	04295390+2627543	0.57			19.81 ± 0.09	6.2
896	04 29 54.00	+24 42 30.1	0.90	13-OM-023	04295402+2442301	0.31			20.17 ± 0.11	7.2
897	04 29 54.02	+24 33 45.6	0.90	13-OM-024	04295404+2433459	0.46			20.47 ± 0.13	5.3
898	04 29 54.29	+26 38 14.5	0.71	15-OM-160	04295435+2638143	0.84	15-052	2.29	15.74 ± 0.02	105.4
899	04 29 54.32	+26 30 33.8	0.87	15-OM-161	04295428+2630344	0.86			19.52 ± 0.05	8.0
900	04 29 54.44	+26 04 56.1	0.74	14-OM-005	04295438+2604562	0.87			20.16 ± 0.19	8.2
901	04 29 54.53	+26 32 45.8	0.84	15-OM-162	04295450+2632454	0.52			19.38 ± 0.10	8.8
902	04 29 55.13	+26 35 28.2	0.91	15-OM-163	04295524+2635284	1.60			19.92 ± 0.33	5.5
903	04 29 55.24	+26 06 37.5	0.75	14-OM-006					21.30 ± 0.57	3.2
904	04 29 55.34	+26 38 39.9	0.83	15-OM-164	04295538+2638397	0.65			19.23 ± 0.17	9.6
905	04 29 55.71	+26 32 26.2	0.91	15-OM-165	04295568+2632259	0.43			20.47 ± 0.17	3.4
906	04 29 56.16	+26 33 32.5	0.90	15-OM-166	04295615+2633321	0.33			20.44 ± 0.00	3.6
907	04 29 56.46	+26 02 37.3	0.73	14-OM-007	04295640+2602378	0.92			20.00 ± 0.10	9.9
908	04 29 56.60	+26 37 01.8	0.73	15-OM-167	04295655+2637013	0.65			17.49 ± 0.02	37.6
909	04 29 56.66	+26 07 59.1	0.68	14-OM-008	04295666+2607588	0.26			14.70 ± 0.01	341.5
910	04 29 56.68	+26 27 01.5	0.76	15-OM-168	04295664+2627015	0.48			18.33 ± 0.03	21.1
911	04 29 56.68	+26 01 49.5	0.69	14-OM-009	04295667+2601495	0.09			17.71 ± 0.01	62.3
912	04 29 57.15	+26 10 11.0	0.72	14-OM-010	04295710+2610108	0.71			19.71 ± 0.05	12.3
913	04 29 57.38	+26 04 18.7	0.69	14-OM-011	04295740+2604184	0.42			17.95 ± 0.03	52.1
914	04 29 57.41	+24 42 42.5	0.90	13-OM-025	04295742+2442425	0.16			20.62 ± 0.11	5.5
915	04 29 57.47	+26 03 49.5	0.69	14-OM-012	04295747+2603491	0.33			17.70 ± 0.03	62.2
916	04 29 57.51	+26 05 22.1	0.75	14-OM-013	04295746+2605213	0.96			21.15 ± 0.50	3.8
917	04 29 57.65	+26 37 04.9	0.89	15-OM-169	04295761+2637042	0.78			20.17 ± 0.11	4.4
918	04 29 57.81	+26 00 19.0	0.73	14-OM-014	04295782+2600192	0.36			19.84 ± 0.07	11.7
919	04 29 57.86	+26 03 10.8	0.70	14-OM-015	04295786+2603109	0.09			18.81 ± 0.05	27.1
920	04 29 57.97	+24 39 29.2	0.89	13-OM-026	04295798+2439292	0.12			19.32 ± 0.10	15.0
921	04 29 58.00	+26 27 27.7	0.90	15-OM-170	04295805+2627276	0.83			20.53 ± 0.53	3.5
922	04 29 58.05	+24 43 26.8	0.91	13-OM-027	04295809+2443257	1.20			21.20 ± 0.57	3.3
923	04 29 58.08	+26 01 45.8	0.76	14-OM-016					20.59 ± 0.33	5.7
924	04 29 58.14	+24 42 59.1	0.87	13-OM-028	04295811+2442591	0.29			18.52 ± 0.02	30.0
925	04 29 58.24	+26 26 07.9	0.79	15-OM-171	04295824+2626082	0.36			18.82 ± 0.03	14.5
926	04 29 58.26	+25 58 52.5	0.68	14-OM-017	04295815+2558525	1.44	14-010	2.38	18.02 ± 0.20	66.5
927	04 29 58.44	+26 36 49.3	0.81	15-OM-172	04295840+2636494	0.46			19.17 ± 0.14	10.2
928	04 29 58.55	+26 30 11.6	0.80	15-OM-173	04295852+2630113	0.33			18.99 ± 0.09	12.3

Table A.1. (Continued)

#	RA _{corr} h m s	δ_{corr} $^{\circ} \text{' } \text{''}$	Δ $(^{\circ})$	XEST OM	2MASS	ρ_1 $(^{\circ})$	XEST	ρ_2 $(^{\circ})$	Mag	Signif.
929	04 29 58.69	+26 01 36.7	0.76	14-OM-018	04295862+2601370	1.00			21.00 ± 0.48	3.9
930	04 29 58.81	+26 07 02.2	0.71	14-OM-019	04295878+2607021	0.40			19.16 ± 0.04	20.6
931	04 29 58.82	+26 09 09.2	0.70	14-OM-020	04295878+2609087	0.71			18.77 ± 0.05	28.0
932	04 29 58.87	+26 03 59.9	0.68	14-OM-021	04295889+2603596	0.44			17.47 ± 0.00	72.7
933	04 29 58.90	+26 31 19.1	0.90	15-OM-174	04295890+2631192	0.19			20.08 ± 0.37	4.9
934	04 29 58.92	+24 37 00.3	0.90	13-OM-029	04295903+2436586	2.32			20.22 ± 0.24	7.2
935	04 29 58.97	+24 41 51.5	0.91	13-OM-030	04295901+2441508	0.92			20.50 ± 0.24	5.4
936	04 29 59.04	+24 42 31.9	0.89	13-OM-031	04295902+2442315	0.36			19.44 ± 0.14	13.9
937	04 29 59.04	+26 07 25.9	0.71	14-OM-022	04295901+2607255	0.56			19.18 ± 0.03	20.2
938	04 29 59.30	+24 38 56.7	0.87	13-OM-032	04295930+2438570	0.36			17.66 ± 0.03	56.6
939	04 29 59.43	+26 10 26.3	0.68	14-OM-023	04295939+2610265	0.51			17.58 ± 0.00	84.1
940	04 29 59.58	+24 40 25.0	0.91	13-OM-033	04295958+2440254	0.41			20.34 ± 0.26	6.1
941	04 29 59.60	+25 59 47.2	0.68	14-OM-024	04295961+2559473	0.34			17.55 ± 0.00	69.9
942	04 29 59.75	+26 08 55.0	0.73	14-OM-025	04295969+2608552	0.80			19.96 ± 0.06	10.4
943	04 29 59.91	+26 39 07.2	0.74	15-OM-175	04295991+2639071	0.09			17.80 ± 0.03	30.2
944	04 29 59.92	+25 56 42.6	0.74	14-OM-026	04295996+2556422	0.74			20.66 ± 0.24	5.5
945	04 30 00.03	+26 32 21.5	0.87	15-OM-176	04295999+2632218	0.50			19.78 ± 0.11	6.1
946	04 30 00.20	+24 41 57.8	0.90	13-OM-034	04300027+2441572	1.19			20.94 ± 0.15	4.0
947	04 30 00.47	+26 26 04.5	0.84	15-OM-177	04300046+2626047	0.25			19.53 ± 0.01	8.1
948	04 30 00.47	+26 08 44.8	0.75	14-OM-027					20.90 ± 0.12	4.4
949	04 30 00.65	+26 30 18.9	0.87	15-OM-178	04300061+2630186	0.59			19.72 ± 0.18	6.4
950	04 30 00.80	+26 38 11.2	0.84	15-OM-179	04300075+2638114	0.66			19.52 ± 0.17	7.4
951	04 30 01.16	+26 30 09.8	0.85	15-OM-180	04300112+2630094	0.64			19.51 ± 0.13	7.9
952	04 30 01.19	+26 02 33.5	0.74	14-OM-028					20.58 ± 0.17	5.7
953	04 30 01.30	+26 39 43.1	0.77	15-OM-181	04300128+2639431	0.16			18.60 ± 0.07	16.4
954	04 30 01.45	+24 40 12.0	0.91	13-OM-035	04300143+2440125	0.58			20.71 ± 0.25	4.8
955	04 30 01.84	+26 35 21.1	0.90	15-OM-182	04300186+2635215	0.58			20.44 ± 0.53	3.5
956	04 30 02.00	+26 01 18.9	0.74	14-OM-029					20.45 ± 0.07	6.8
957	04 30 02.22	+25 57 27.8	0.69	14-OM-030	04300225+2557278	0.39			18.04 ± 0.02	49.6
958	04 30 02.48	+25 53 42.0	0.69	14-OM-031	04300248+2553403	1.66			19.48 ± 0.04	32.2
959	04 30 02.55	+26 29 06.0	0.91	15-OM-183	04300261+2629056	0.95			20.29 ± 0.46	4.0
960	04 30 02.61	+26 36 01.5	0.91	15-OM-184	04300261+2636013	0.19			20.46 ± 0.53	3.5
961	04 30 02.66	+25 56 03.3	0.71	14-OM-032	04300269+2556030	0.56			19.15 ± 0.06	20.9
962	04 30 02.66	+25 59 37.2	0.73	14-OM-033	04300263+2559376	0.57			20.02 ± 0.07	9.9
963	04 30 02.70	+24 44 03.6	0.90	13-OM-036	04300267+2444033	0.44			19.62 ± 0.07	12.0
964	04 30 02.70	+26 32 30.7	0.87	15-OM-185	04300268+2632304	0.30			19.90 ± 0.13	5.6
965	04 30 02.94	+26 08 24.0	0.73	14-OM-034	04300288+2608232	1.06			20.02 ± 0.08	9.8
966	04 30 03.14	+26 34 17.8	0.91	15-OM-186	04300327+2634171	1.94			20.39 ± 0.50	3.7
967	04 30 03.20	+24 39 12.3	0.91	13-OM-037	04300322+2439127	0.62			20.77 ± 0.25	4.2
968	04 30 03.28	+26 34 04.1	0.84	15-OM-187	04300329+2634039	0.23			19.44 ± 0.15	8.3
969	04 30 03.44	+26 01 14.0	0.71	14-OM-035	04300344+2601133	0.65			19.09 ± 0.03	21.7
970	04 30 03.47	+26 00 22.4	0.75	14-OM-036	04300350+2600230	0.73			21.18 ± 0.04	3.6
971	04 30 03.48	+25 58 22.9	0.68	14-OM-037	04300350+2558227	0.35			15.94 ± 0.01	182.0
972	04 30 03.49	+26 26 23.1	0.89	15-OM-188	04300346+2626234	0.46			20.21 ± 0.09	4.4
973	04 30 03.72	+24 44 30.2	0.91	13-OM-038	04300372+2444291	1.02			20.08 ± 0.04	8.2
974	04 30 03.85	+26 36 42.9	0.86	15-OM-189	04300388+2636430	0.42			19.74 ± 0.09	6.5
975	04 30 04.17	+25 59 17.7	0.74	14-OM-038	04300420+2559179	0.45			20.24 ± 0.18	8.0
976	04 30 04.18	+25 56 39.6	0.68	14-OM-039	04300421+2556394	0.49			17.48 ± 0.01	73.1
977	04 30 04.27	+24 37 12.3	0.91	13-OM-039	04300447+2437129	2.86			21.01 ± 0.48	3.9
978	04 30 04.35	+25 54 00.7	0.69	14-OM-040	04300439+2554000	0.95			17.84 ± 0.02	55.0
979	04 30 04.65	+26 38 00.9	0.80	15-OM-190	04300466+2638011	0.27			19.03 ± 0.11	11.5
980	04 30 04.65	+26 26 01.1	0.89	15-OM-191	04300459+2626016	1.02			19.96 ± 0.10	5.5
981	04 30 04.74	+26 39 11.3	0.92	15-OM-192	04300473+2639113	0.12			20.56 ± 0.60	3.1
982	04 30 04.82	+24 37 18.2	0.90	13-OM-040	04300478+2437184	0.55			20.54 ± 0.12	5.8
983	04 30 04.83	+25 55 13.1	0.71	14-OM-041	04300486+2555130	0.42			19.25 ± 0.09	18.9
984	04 30 04.90	+24 36 58.8	0.86	13-OM-041	04300487+2436589	0.43			17.45 ± 0.02	66.2
985	04 30 04.94	+26 38 44.8	0.86	15-OM-193	04300492+2638454	0.68			19.74 ± 0.16	6.2
986	04 30 05.08	+24 41 48.6	0.90	13-OM-042	04300507+2441486	0.02			20.41 ± 0.14	6.4

Table A.1. (Continued)

#	RA _{corr} h m s	δ _{corr} ° ' "	Δ ("")	XEST OM	2MASS	ρ ₁ ("")	XEST	ρ ₂ ("")	Mag	Signif.
987	04 30 05.30	+26 26 21.8	0.92	15-OM-194	04300525+2626216	0.60			20.17 ± 0.18	4.4
988	04 30 05.43	+26 09 59.3	0.70	14-OM-042	04300543+2609589	0.34			18.83 ± 0.03	26.8
989	04 30 05.43	+26 32 30.1	0.86	15-OM-195	04300544+2632300	0.24			19.87 ± 0.27	5.4
990	04 30 05.50	+25 56 04.0	0.70	14-OM-043	04300551+2556037	0.34			18.83 ± 0.03	27.4
991	04 30 05.66	+26 39 57.0	0.71	15-OM-196	04300566+2639572	0.28			13.54 ± 0.01	310.2
992	04 30 05.81	+26 26 36.7	0.79	15-OM-197	04300577+2626366	0.40			18.75 ± 0.10	15.1
993	04 30 05.81	+26 04 55.1	0.72	14-OM-044	04300578+2604552	0.34			19.46 ± 0.15	15.3
994	04 30 06.09	+26 38 21.3	0.82	15-OM-198	04300607+2638216	0.46			19.17 ± 0.08	10.4
995	04 30 06.16	+26 02 49.1	0.74	14-OM-045	04300614+2602487	0.43			20.39 ± 0.13	6.9
996	04 30 06.16	+26 03 41.4	0.75	14-OM-046	04300611+2603415	0.61			20.84 ± 0.38	4.9
997	04 30 06.16	+25 57 03.3	0.68	14-OM-047	04300620+2557030	0.59			16.66 ± 0.00	121.7
998	04 30 06.32	+26 36 32.4	0.83	15-OM-199	04300632+2636324	0.16			19.41 ± 0.15	8.4
999	04 30 06.36	+26 04 52.8	0.74	14-OM-048	04300632+2604525	0.51			20.46 ± 0.05	6.6
1000	04 30 06.60	+26 35 19.5	0.86	15-OM-200	04300657+2635201	0.72			19.82 ± 0.18	5.9
1001	04 30 06.62	+26 25 57.2	0.88	15-OM-201	04300664+2625566	0.68			19.79 ± 0.13	6.3
1002	04 30 06.67	+26 32 57.8	0.84	15-OM-202	04300669+2632584	0.75			19.26 ± 0.13	9.8
1003	04 30 06.79	+26 31 55.0	0.89	15-OM-203	04300686+2631554	1.10			20.37 ± 0.03	3.8
1004	04 30 06.85	+25 53 42.6	0.68	14-OM-049	04300691+2553426	0.79			16.77 ± 0.00	112.3
1005	04 30 06.93	+26 02 23.9	0.68	14-OM-050	04300693+2602236	0.22			16.09 ± 0.01	167.9
1006	04 30 06.97	+26 06 35.0	0.72	14-OM-051	04300694+2606342	0.79			19.03 ± 0.05	22.6
1007	04 30 07.16	+26 10 13.1	0.74	14-OM-052	04300711+2610123	0.95			20.48 ± 0.16	6.3
1008	04 30 07.18	+26 06 29.5	0.73	14-OM-053	04300716+2606304	0.93			19.40 ± 0.10	17.0
1009	04 30 07.28	+24 44 13.4	0.91	13-OM-043	04300727+2444131	0.22			20.42 ± 0.21	5.5
1010	04 30 07.42	+26 05 49.9	0.72	14-OM-054	04300737+2605494	0.74			19.66 ± 0.06	13.3
1011	04 30 07.43	+25 54 41.5	0.75	14-OM-055	04300741+2554427	1.19			20.73 ± 0.12	5.2
1012	04 30 07.89	+26 02 10.1	0.75	14-OM-056					20.91 ± 0.04	4.4
1013	04 30 07.93	+25 59 13.3	0.74	14-OM-057	04300796+2559128	0.64			20.29 ± 0.21	7.2
1014	04 30 08.05	+26 41 51.1	0.85	15-OM-204	04300807+2641513	0.42			19.69 ± 0.07	6.5
1015	04 30 08.13	+25 56 55.7	0.68	14-OM-058	04300817+2556556	0.55			15.56 ± 0.00	221.9
1016	04 30 08.22	+25 54 08.8	0.70	14-OM-059	04300827+2554086	0.83			18.81 ± 0.02	26.9
1017	04 30 08.23	+26 07 16.8	0.69	14-OM-060	04300822+2607162	0.55			17.65 ± 0.02	64.1
1018	04 30 08.27	+26 07 25.2	0.75	14-OM-061	04300821+2607248	0.77			20.12 ± 0.22	8.4
1019	04 30 08.40	+25 59 55.0	0.72	14-OM-062	04300839+2559545	0.41			19.50 ± 0.08	15.3
1020	04 30 08.48	+24 38 19.5	0.87	13-OM-044	04300847+2438194	0.06			18.00 ± 0.06	44.8
1021	04 30 08.64	+24 38 36.0	0.90	13-OM-045	04300870+2438357	0.85			20.40 ± 0.12	6.6
1022	04 30 08.74	+26 07 28.3	0.76	14-OM-063					19.84 ± 0.17	10.8
1023	04 30 08.76	+24 38 39.4	0.99	13-OM-046	04300888+2438392	1.73			20.14 ± 0.37	5.0
1024	04 30 08.80	+24 45 11.0	0.90	13-OM-047	04300883+2445112	0.56			20.55 ± 0.23	5.6
1025	04 30 08.81	+25 55 42.9	0.72	14-OM-064	04300886+2555430	0.78			19.52 ± 0.08	15.4
1026	04 30 08.81	+25 58 08.1	0.74	14-OM-065					20.28 ± 0.15	7.7
1027	04 30 09.00	+26 05 35.0	0.72	14-OM-066	04300900+2605352	0.28			19.67 ± 0.04	13.2
1028	04 30 09.06	+26 10 19.2	0.71	14-OM-067	04300901+2610190	0.57			19.17 ± 0.15	19.8
1029	04 30 09.08	+26 07 30.4	0.72	14-OM-068	04300909+2607302	0.23			19.72 ± 0.13	12.3
1030	04 30 09.18	+26 41 34.6	0.71	15-OM-205	04300919+2641346	0.26			15.13 ± 0.01	144.0
1031	04 30 09.23	+24 40 26.5	0.86	13-OM-048	04300920+2440270	0.66			16.63 ± 0.02	110.9
1032	04 30 09.46	+26 04 36.1	0.75	14-OM-069					20.47 ± 0.35	5.6
1033	04 30 09.46	+24 42 59.9	0.91	13-OM-049	04300954+2442588	1.49			21.26 ± 0.59	3.2
1034	04 30 09.64	+26 35 05.9	0.81	15-OM-206	04300964+2635060	0.18			19.21 ± 0.11	10.2
1035	04 30 09.84	+24 38 22.5	0.89	13-OM-050	04300983+2438226	0.10			18.99 ± 0.03	20.5
1036	04 30 09.88	+24 29 05.8	0.91	13-OM-051	04300988+2429058	0.04			20.81 ± 0.40	3.5
1037	04 30 10.26	+24 38 45.1	0.87	13-OM-052	04301027+2438450	0.23			18.01 ± 0.03	44.1
1038	04 30 10.27	+26 04 22.3	0.74	14-OM-070	04301023+2604225	0.51			20.42 ± 0.22	6.6
1039	04 30 10.33	+26 05 57.0	0.71	14-OM-071	04301033+2605566	0.38			19.29 ± 0.04	18.2
1040	04 30 10.40	+24 38 23.6	0.89	13-OM-053	04301039+2438236	0.16			19.41 ± 0.12	14.0
1041	04 30 10.51	+26 04 44.7	0.74	14-OM-073					20.61 ± 0.30	6.1
1042	04 30 10.51	+25 56 36.5	0.68	14-OM-072	04301054+2556364	0.42			16.99 ± 0.01	100.2
1043	04 30 10.71	+24 45 35.1	0.87	13-OM-054	04301067+2445348	0.47			16.74 ± 0.05	103.3
1044	04 30 10.74	+25 53 34.5	0.71	14-OM-074					19.92 ± 0.08	20.6

Table A.1. (Continued)

#	RA _{corr} h m s	δ _{corr} ° ' "	Δ ("")	XEST OM	2MASS	ρ ₁ ("")	XEST	ρ ₂ ("")	Mag	Signif.
1045	04 30 10.96	+25 59 35.4	0.70	14-OM-075	04301098+2559348	0.59			18.88 ± 0.03	25.9
1046	04 30 11.09	+26 31 33.0	0.91	15-OM-207	04301110+2631335	0.54			20.44 ± 0.52	3.5
1047	04 30 11.27	+25 55 51.3	0.75	14-OM-076	04301130+2555515	0.47			20.81 ± 0.36	5.2
1048	04 30 11.37	+26 08 59.7	0.74	14-OM-077	04301132+2608589	0.94			20.87 ± 0.06	4.7
1049	04 30 11.42	+26 32 10.2	0.94	15-OM-208	04301144+2632107	0.56			20.30 ± 0.45	4.1
1050	04 30 11.48	+26 10 05.1	0.68	14-OM-078	04301145+2610048	0.36			15.79 ± 0.00	196.9
1051	04 30 11.52	+26 02 02.0	0.72	14-OM-079	04301150+2602019	0.16			19.55 ± 0.03	14.9
1052	04 30 11.54	+25 54 06.5	0.68	14-OM-080	04301157+2554067	0.61			16.97 ± 0.01	100.7
1053	04 30 11.77	+26 01 51.5	0.70	14-OM-081	04301177+2601513	0.19			18.81 ± 0.04	27.6
1054	04 30 11.95	+26 03 43.0	0.69	14-OM-082	04301197+2603429	0.43			18.32 ± 0.00	40.1
1055	04 30 12.16	+26 08 47.3	0.74	14-OM-083	04301204+2608473	1.56			20.83 ± 0.10	4.7
1056	04 30 12.41	+26 07 17.7	0.74	14-OM-084					20.34 ± 0.24	7.6
1057	04 30 12.54	+26 01 25.3	0.70	14-OM-085	04301254+2601256	0.32			18.66 ± 0.01	31.1
1058	04 30 12.59	+24 42 18.6	0.90	13-OM-055	04301259+2442183	0.23			19.68 ± 0.27	10.6
1059	04 30 12.69	+24 45 00.6	0.88	13-OM-056	04301267+2445005	0.20			19.02 ± 0.05	19.4
1060	04 30 12.80	+24 36 12.2	0.90	13-OM-057	04301284+2436123	0.61			20.14 ± 0.27	7.0
1061	04 30 12.89	+24 41 50.5	0.98	13-OM-058					20.65 ± 0.58	3.2
1062	04 30 12.94	+25 57 13.8	0.69	14-OM-086	04301296+2557134	0.46			17.49 ± 0.01	72.5
1063	04 30 13.07	+24 38 52.7	0.90	13-OM-059	04301307+2438538	1.11			20.66 ± 0.29	4.8
1064	04 30 13.08	+24 43 34.9	0.88	13-OM-060	04301306+2443346	0.33			18.64 ± 0.03	27.1
1065	04 30 13.09	+24 37 36.3	0.87	13-OM-061	04301308+2437363	0.11			18.05 ± 0.02	42.7
1066	04 30 13.21	+24 31 57.1	0.87	13-OM-062	04301318+2431571	0.35	13-028	1.79	17.82 ± 0.03	50.6
1067	04 30 13.23	+26 02 35.5	0.72	14-OM-087	04301323+2602353	0.14			19.68 ± 0.04	13.4
1068	04 30 13.25	+26 34 17.4	0.89	15-OM-209	04301326+2634176	0.30			19.77 ± 0.37	5.3
1069	04 30 13.27	+25 55 34.9	0.69	14-OM-088	04301332+2555348	0.71			18.38 ± 0.03	38.8
1070	04 30 13.51	+26 00 54.2	0.74	14-OM-089	04301352+2600542	0.29			20.26 ± 0.19	7.8
1071	04 30 13.51	+26 09 58.7	0.68	14-OM-090	04301349+2609585	0.26			15.47 ± 0.01	232.5
1072	04 30 13.51	+26 25 48.6	0.83	15-OM-210	04301352+2625489	0.45			19.19 ± 0.11	10.6
1073	04 30 13.64	+25 54 50.2	0.75	14-OM-091					21.33 ± 0.57	3.3
1074	04 30 13.67	+26 07 27.6	0.74	14-OM-092					20.56 ± 0.22	5.8
1075	04 30 13.79	+24 44 57.7	0.90	13-OM-063	04301378+2444579	0.26			20.73 ± 0.15	4.7
1076	04 30 13.82	+25 53 44.1	0.68	14-OM-093	04301386+2553447	0.88			16.12 ± 0.00	165.7
1077	04 30 13.84	+26 05 13.6	0.73	14-OM-094	04301383+2605135	0.09			19.88 ± 0.02	11.2
1078	04 30 14.01	+25 56 06.2	0.71	14-OM-095	04301405+2556056	0.85			18.77 ± 0.04	28.7
1079	04 30 14.10	+25 59 09.6	0.68	14-OM-096	04301412+2559096	0.31			17.05 ± 0.01	96.1
1080	04 30 14.46	+26 03 20.1	0.69	14-OM-097	04301447+2603201	0.08			17.82 ± 0.02	57.7
1081	04 30 14.81	+26 07 33.2	0.69	14-OM-098	04301478+2607327	0.62			18.31 ± 0.02	39.9
1082	04 30 15.04	+26 40 41.3	0.88	15-OM-211	04301505+2640416	0.42			20.05 ± 0.32	4.3
1083	04 30 15.13	+26 03 06.1	0.69	14-OM-099	04301514+2603059	0.34			17.89 ± 0.01	54.9
1084	04 30 15.17	+25 59 37.1	0.72	14-OM-100	04301513+2559373	0.57			19.46 ± 0.05	16.1
1085	04 30 15.46	+25 57 21.5	0.75	14-OM-101					21.14 ± 0.49	3.8
1086	04 30 15.46	+25 54 02.2	0.71	14-OM-102	04301549+2554021	0.44			19.39 ± 0.02	17.3
1087	04 30 15.65	+26 05 12.3	0.74	14-OM-103	04301563+2605123	0.19			20.13 ± 0.20	8.3
1088	04 30 15.66	+26 02 35.6	0.75	14-OM-104					21.27 ± 0.55	3.4
1089	04 30 15.66	+26 04 32.1	0.70	14-OM-105	04301567+2604320	0.22			18.50 ± 0.02	35.0
1090	04 30 15.74	+26 33 27.7	0.79	15-OM-212	04301576+2633277	0.31			18.87 ± 0.08	13.5
1091	04 30 15.80	+26 03 15.1	0.72	14-OM-106	04301582+2603151	0.31			19.67 ± 0.08	13.3
1092	04 30 15.87	+25 55 57.7	0.72	14-OM-107	04301591+2555575	0.54			19.59 ± 0.07	14.4
1093	04 30 16.05	+24 41 56.5	0.90	13-OM-064	04301601+2441557	0.91			20.71 ± 0.18	4.8
1094	04 30 16.19	+25 56 18.5	0.70	14-OM-108	04301622+2556183	0.46			18.79 ± 0.02	28.1
1095	04 30 16.30	+25 54 49.1	0.70	14-OM-109	04301635+2554492	0.71			18.81 ± 0.02	27.9
1096	04 30 16.31	+25 55 39.3	0.72	14-OM-110	04301634+2555389	0.66			19.63 ± 0.11	13.9
1097	04 30 16.39	+26 39 09.4	0.76	15-OM-213	04301644+2639095	0.75			18.17 ± 0.06	23.0
1098	04 30 16.42	+25 59 09.6	0.70	14-OM-111	04301643+2559098	0.30			18.79 ± 0.00	28.1
1099	04 30 16.43	+26 02 41.5	0.73	14-OM-112	04301639+2602414	0.48			19.94 ± 0.07	10.7
1100	04 30 16.57	+24 39 28.5	0.86	13-OM-065	04301655+2439289	0.51			15.77 ± 0.01	180.8
1101	04 30 16.76	+24 29 55.4	0.89	13-OM-066	04301675+2429556	0.32			19.41 ± 0.11	16.0
1102	04 30 16.78	+24 35 41.2	0.87	13-OM-067	04301674+2435413	0.45			18.33 ± 0.04	33.1

Table A.1. (Continued)

#	RA _{corr} h m s	δ _{corr} ° ' "	Δ (")	XEST OM	2MASS	ρ ₁ (")	XEST	ρ ₂ (")	Mag	Signif.
1103	04 30 16.87	+26 32 47.2	0.73	15-OM-214	04301689+2632473	0.45			17.72 ± 0.02	32.5
1104	04 30 17.10	+25 54 04.3	0.75	14-OM-113	04301709+2554052	1.04			20.87 ± 0.20	4.5
1105	04 30 17.13	+26 10 27.2	0.73	14-OM-114	04301708+2610274	0.63			19.79 ± 0.03	11.8
1106	04 30 17.22	+26 35 50.0	0.89	15-OM-215	04301724+2635503	0.45			20.11 ± 0.33	4.2
1107	04 30 17.25	+25 54 19.6	0.75	14-OM-115					20.37 ± 0.16	7.2
1108	04 30 17.36	+26 32 08.8	0.74	15-OM-216	04301742+2632087	0.84			18.06 ± 0.01	25.5
1109	04 30 17.47	+24 42 05.7	0.89	13-OM-068	04301744+2442057	0.36			19.38 ± 0.11	14.7
1110	04 30 17.62	+25 54 02.1	0.74	14-OM-116					20.59 ± 0.27	5.8
1111	04 30 17.63	+26 00 07.1	0.69	14-OM-117	04301764+2600070	0.14			17.67 ± 0.01	64.4
1112	04 30 17.91	+26 06 41.6	0.73	14-OM-118	04301793+2606417	0.35			19.91 ± 0.17	10.3
1113	04 30 17.98	+25 54 44.0	0.74	14-OM-119	04301812+2554437	1.94			20.11 ± 0.03	9.4
1114	04 30 18.22	+26 03 58.4	0.74	14-OM-120	04301817+2603581	0.72			20.47 ± 0.24	6.5
1115	04 30 18.31	+25 57 01.7	0.73	14-OM-121	04301831+2557020	0.34			19.99 ± 0.00	10.3
1116	04 30 18.34	+26 26 29.6	0.83	15-OM-217					20.48 ± 0.53	3.5
1117	04 30 18.40	+25 59 30.9	0.74	14-OM-122	04301838+2559309	0.22			20.62 ± 0.13	5.8
1118	04 30 18.73	+25 58 47.0	0.69	14-OM-123	04301873+2558469	0.13			17.81 ± 0.02	58.7
1119	04 30 18.83	+26 02 55.2	0.74	14-OM-124					20.54 ± 0.09	6.2
1120	04 30 18.84	+26 03 53.5	0.75	14-OM-125	04301884+2603540	0.60			20.96 ± 0.29	4.0
1121	04 30 18.91	+26 07 58.3	0.74	14-OM-126	04301888+2607579	0.45			20.31 ± 0.11	7.4
1122	04 30 18.94	+24 37 12.4	0.89	13-OM-069	04301896+2437128	0.60			19.38 ± 0.04	14.7
1123	04 30 19.00	+25 54 40.9	0.74	14-OM-127	04301904+2554406	0.69			20.44 ± 0.13	6.8
1124	04 30 19.08	+26 01 16.4	0.70	14-OM-128	04301909+2601163	0.25			18.48 ± 0.02	35.6
1125	04 30 19.71	+24 41 09.9	0.91	13-OM-070	04301969+2441093	0.61			20.19 ± 0.08	7.3
1126	04 30 19.90	+25 55 08.9	0.73	14-OM-129	04301990+2555089	0.15			19.80 ± 0.13	11.9
1127	04 30 19.90	+26 07 51.5	0.74	14-OM-131	04301981+2607517	1.19			20.60 ± 0.11	5.7
1128	04 30 19.90	+25 56 07.3	0.69	14-OM-130	04301992+2556074	0.30			18.34 ± 0.02	39.7
1129	04 30 19.94	+26 05 58.5	0.70	14-OM-132	04301993+2605590	0.49			18.41 ± 0.08	37.0
1130	04 30 20.05	+25 54 01.6	0.68	14-OM-133	04302010+2554017	0.68			15.29 ± 0.01	254.9
1131	04 30 20.21	+25 57 27.0	0.72	14-OM-134	04302019+2557267	0.33			19.72 ± 0.08	12.8
1132	04 30 20.34	+25 55 15.9	0.69	14-OM-135	04302038+2555158	0.57			18.16 ± 0.03	45.7
1133	04 30 20.35	+25 54 41.4	0.70	14-OM-136	04302039+2554413	0.68			18.65 ± 0.03	31.6
1134	04 30 20.36	+24 43 37.5	0.87	13-OM-071	04302032+2443378	0.60			18.09 ± 0.02	41.1
1135	04 30 20.36	+24 40 49.3	0.89	13-OM-072	04302036+2440492	0.05			19.50 ± 0.07	13.3
1136	04 30 20.39	+26 05 49.9	0.75	14-OM-137	04302035+2605504	0.69			20.74 ± 0.26	4.8
1137	04 30 20.69	+26 04 22.4	0.71	14-OM-138	04302064+2604223	0.67			19.13 ± 0.04	20.7
1138	04 30 20.92	+26 04 01.0	0.71	14-OM-139	04302088+2604011	0.62			19.21 ± 0.10	19.0
1139	04 30 20.95	+25 57 40.7	0.75	14-OM-140					20.66 ± 0.31	5.9
1140	04 30 21.37	+26 07 08.5	0.75	14-OM-141	04302134+2607084	0.27			20.67 ± 0.02	5.5
1141	04 30 21.46	+26 28 05.5	0.92	15-OM-218	04302145+2628059	0.48			20.47 ± 0.48	3.7
1142	04 30 21.63	+26 01 26.8	0.74	14-OM-142	04302163+2601253	1.44			20.01 ± 0.00	9.9
1143	04 30 21.72	+26 01 23.9	0.74	14-OM-143					19.73 ± 0.13	13.4
1144	04 30 21.89	+26 07 45.0	0.74	14-OM-144	04302187+2607449	0.16			20.06 ± 0.29	8.4
1145	04 30 22.07	+26 06 02.5	0.71	14-OM-145	04302205+2606024	0.23			19.28 ± 0.02	18.5
1146	04 30 22.22	+26 07 19.7	0.74	14-OM-146	04302220+2607191	0.57			20.13 ± 0.26	8.2
1147	04 30 22.44	+25 55 34.0	0.70	14-OM-147	04302246+2555343	0.56			18.72 ± 0.09	29.4
1148	04 30 22.80	+26 06 39.9	0.74	14-OM-148	04302278+2606399	0.16			19.99 ± 0.10	10.1
1149	04 30 22.91	+24 36 46.7	0.91	13-OM-073	04302292+2436462	0.48			20.56 ± 0.19	5.0
1150	04 30 22.92	+25 59 11.2	0.71	14-OM-149	04302292+2559107	0.48			19.10 ± 0.18	21.2
1151	04 30 23.45	+26 06 19.0	0.71	14-OM-150	04302344+2606192	0.24			19.13 ± 0.05	20.8
1152	04 30 23.57	+26 01 47.0	0.70	14-OM-151	04302355+2601471	0.31			18.79 ± 0.01	26.9
1153	04 30 23.61	+25 57 40.4	0.70	14-OM-152	04302363+2557403	0.36			18.75 ± 0.07	29.0
1154	04 30 23.68	+25 54 17.3	0.75	14-OM-153					20.62 ± 0.20	5.7
1155	04 30 23.86	+26 04 07.4	0.71	14-OM-154	04302376+2604071	1.28			19.57 ± 0.23	11.7
1156	04 30 23.89	+26 03 31.2	0.73	14-OM-155	04302385+2603318	0.76			19.92 ± 0.15	9.9
1157	04 30 24.03	+25 59 49.1	0.74	14-OM-156	04302395+2559489	1.10			20.52 ± 0.21	6.1
1158	04 30 24.23	+25 59 26.9	0.70	14-OM-157	04302420+2559271	0.47			18.74 ± 0.01	28.9
1159	04 30 24.27	+26 10 52.4	0.72	14-OM-158	04302422+2610523	0.63			19.54 ± 0.07	14.8
1160	04 30 24.54	+25 57 59.3	0.76	14-OM-159	04302450+2557589	0.67			20.57 ± 0.32	5.8

Table A.1. (Continued)

#	RA _{corr} h m s	δ _{corr} ° ′ ″	Δ (")	XEST OM	2MASS	ρ ₁ (")	XEST	ρ ₂ (")	Mag	Signif.
1567	04 33 41.39	+22 54 53.7	0.62	17-OM-040	04334138+2254535	0.17			19.23 ± 0.04	17.6
1568	04 33 41.78	+23 01 52.0	0.61	17-OM-041	04334177+2301519	0.15			18.73 ± 0.04	26.4
1569	04 33 42.68	+22 49 15.4	0.67	17-OM-042	04334261+2249164	1.28			20.47 ± 0.30	6.2
1570	04 33 42.85	+22 55 06.5	0.58	17-OM-043	04334286+2255065	0.15			16.34 ± 0.01	136.3
1571	04 33 43.14	+22 59 41.9	0.60	17-OM-044	04334315+2259419	0.13			18.20 ± 0.03	39.7
1572	04 33 43.37	+22 48 56.9	0.67	17-OM-045	04334331+2248576	1.04			20.96 ± 0.46	4.0
1573	04 33 43.54	+22 50 56.7	0.67	17-OM-046	04334355+2250577	1.09			20.92 ± 0.45	4.1
1574	04 33 44.13	+22 56 18.1	0.58	17-OM-047	04334414+2256179	0.26	17-053	1.29	14.40 ± 0.02	371.4
1575	04 33 44.50	+22 55 46.4	0.65	17-OM-048	04334444+2255469	0.93			20.31 ± 0.15	6.7
1576	04 33 45.16	+24 20 35.9	0.87	04-OM-030	04334519+2420357	0.39			18.54 ± 0.05	19.0
1577	04 33 45.17	+22 59 28.5	0.62	17-OM-049	04334517+2259283	0.20			19.25 ± 0.07	17.2
1578	04 33 45.67	+22 58 22.0	0.64	17-OM-050	04334566+2258217	0.30			19.62 ± 0.12	12.4
1579	04 33 45.84	+22 56 01.4	0.63	17-OM-051	04334585+2256014	0.20			19.57 ± 0.07	13.0
1580	04 33 45.96	+22 59 04.1	0.66	17-OM-052					20.44 ± 0.28	5.5
1581	04 33 46.05	+22 55 25.5	0.65	17-OM-053	04334602+2255261	0.80			20.08 ± 0.09	8.5
1582	04 33 46.98	+22 56 07.8	0.65	17-OM-054	04334694+2256073	0.74			20.28 ± 0.16	6.9
1583	04 33 47.57	+22 57 37.8	0.66	17-OM-055					20.57 ± 0.34	5.5
1584	04 33 47.88	+22 54 32.0	0.65	17-OM-056	04334787+2254320	0.05			20.34 ± 0.06	6.8
1585	04 33 48.00	+24 18 00.3	0.96	04-OM-031	04334787+2418005	1.83			20.00 ± 0.14	5.5
1586	04 33 48.06	+22 56 01.1	0.61	17-OM-057	04334808+2256011	0.32	17-055	0.32	18.62 ± 0.07	28.8
1587	04 33 48.24	+24 22 38.6	0.92	04-OM-032	04334826+2422381	0.55			19.48 ± 0.14	8.4
1588	04 33 48.25	+24 23 57.0	0.94	04-OM-033	04334828+2423566	0.48			19.78 ± 0.28	6.7
1589	04 33 48.61	+22 54 29.5	0.62	17-OM-058	04334860+2254289	0.49			19.19 ± 0.07	18.3
1590	04 33 48.67	+22 55 12.8	0.65	17-OM-059	04334867+2255130	0.23			19.93 ± 0.05	9.8
1591	04 33 49.33	+23 02 24.7	0.59	17-OM-060	04334931+2302243	0.43			17.51 ± 0.02	64.5
1592	04 33 49.62	+24 19 41.6	0.96	04-OM-034	04334970+2419415	1.15			20.32 ± 0.45	4.2
1593	04 33 49.82	+24 21 40.7	0.88	04-OM-035	04334986+2421409	0.55			18.82 ± 0.12	14.8
1594	04 33 50.11	+22 48 59.8	0.66	17-OM-061	04335013+2249003	0.57			20.50 ± 0.18	5.7
1595	04 33 50.24	+23 01 15.2	0.64	17-OM-062	04335019+2301145	0.87			19.78 ± 0.04	10.9
1596	04 33 50.42	+24 23 34.5	0.92	04-OM-036	04335042+2423338	0.65			19.49 ± 0.12	8.4
1597	04 33 50.46	+24 26 21.3	0.95	04-OM-037	04335039+2426213	0.86			19.94 ± 0.39	4.7
1598	04 33 50.67	+22 55 48.4	0.62	17-OM-063	04335064+2255483	0.35			19.25 ± 0.02	17.4
1599	04 33 51.16	+24 21 19.6	0.93	04-OM-038	04335118+2421192	0.42			19.75 ± 0.01	6.8
1600	04 33 51.93	+22 54 34.4	0.59	17-OM-064	04335196+2254343	0.36			17.70 ± 0.03	57.8
1601	04 33 51.96	+22 49 54.8	0.64	17-OM-065	04335195+2249549	0.14			19.95 ± 0.19	9.1
1602	04 33 51.98	+22 50 30.3	0.58	17-OM-066	04335200+2250301	0.43	17-058	0.83	14.06 ± 0.08	436.0
1603	04 33 52.14	+24 18 06.8	0.91	04-OM-039	04335218+2418069	0.60			19.28 ± 0.06	10.4
1604	04 33 52.32	+24 24 35.4	0.95	04-OM-040	04335230+2424347	0.71			20.37 ± 0.18	3.9
1605	04 33 52.32	+22 59 50.8	0.60	17-OM-067	04335233+2259507	0.27			18.24 ± 0.02	39.0
1606	04 33 52.41	+22 56 32.8	0.63	17-OM-068	04335243+2256323	0.50			19.16 ± 0.12	18.3
1607	04 33 52.44	+22 57 54.8	0.62	17-OM-069	04335245+2257545	0.27			19.20 ± 0.14	17.6
1608	04 33 52.54	+22 56 27.0	0.63	17-OM-070	04335252+2256269	0.24	17-059	0.52	19.12 ± 0.06	19.3
1609	04 33 52.61	+22 58 09.5	0.61	17-OM-071	04335264+2258092	0.53			18.77 ± 0.06	25.5
1610	04 33 53.09	+24 14 22.6	0.87	04-OM-041	04335308+2414229	0.35			18.33 ± 0.04	20.9
1611	04 33 53.18	+24 14 08.0	0.83	04-OM-042	04335319+2414080	0.20			13.50 ± 0.01	356.5
1612	04 33 54.07	+22 54 44.0	0.66	17-OM-072	04335408+2254435	0.46			20.59 ± 0.15	5.4
1613	04 33 54.61	+26 13 26.8	1.03	18-OM-004	04335470+2613275	1.37	18-030	1.37	18.01 ± 0.05	21.1
1614	04 33 54.96	+24 21 29.8	0.93	04-OM-043	04335495+2421297	0.14			19.61 ± 0.14	7.7
1615	04 33 55.64	+24 25 01.7	0.84	04-OM-044	04335562+2425016	0.21	04-060	1.13	17.30 ± 0.01	46.7
1616	04 33 55.67	+24 16 03.5	0.84	04-OM-045	04335570+2416036	0.50			17.60 ± 0.02	38.4
1617	04 33 57.62	+24 24 51.6	0.84	04-OM-046	04335762+2424516	0.06			17.00 ± 0.01	57.1
1618	04 33 58.87	+22 50 59.5	0.66	17-OM-073	04335887+2250596	0.17			20.38 ± 0.12	6.6
1619	04 33 59.13	+24 22 02.6	0.96	04-OM-047	04335907+2422029	0.88			20.33 ± 0.29	3.8
1620	04 33 59.64	+22 50 13.1	0.60	17-OM-074	04335965+2250131	0.29			18.51 ± 0.02	32.2
1621	04 34 00.51	+24 18 38.3	0.93	04-OM-048	04340052+2418380	0.36			19.55 ± 0.38	7.0
1622	04 34 01.33	+24 23 44.7	0.88	04-OM-049	04340132+2423443	0.30			18.66 ± 0.03	17.3
1623	04 34 01.53	+24 22 24.3	0.89	04-OM-050	04340154+2422244	0.21			18.62 ± 0.05	17.8
1624	04 34 01.69	+24 22 29.4	0.91	04-OM-051	04340169+2422291	0.24			18.78 ± 0.14	15.4

Table A.1. (Continued)

#	RA _{corr} h m s	δ _{corr} ° ′ ″	Δ (")	XEST OM	2MASS	ρ ₁ (")	XEST	ρ ₂ (")	Mag	Signif.
1857	04 35 43.64	+22 35 57.4	0.66	09-OM-082	04354364+2235573	0.06			19.84 ± 0.13	10.8
1858	04 35 43.87	+23 00 22.0	0.95	08-OM-029	04354387+2300218	0.18			20.07 ± 0.18	4.2
1859	04 35 44.28	+23 00 43.7	0.93	08-OM-030	04354429+2300430	0.69			19.51 ± 0.09	7.0
1860	04 35 44.82	+24 15 19.7	0.76	12-OM-099	04354479+2415198	0.35			19.83 ± 0.24	5.0
1861	04 35 45.07	+22 44 07.8	0.66	09-OM-083	04354502+2244077	0.63			19.65 ± 0.06	12.9
1862	04 35 45.32	+24 21 36.6	0.76	12-OM-100	04354530+2421367	0.28			19.79 ± 0.18	5.4
1863	04 35 45.39	+22 42 28.4	0.68	09-OM-084	04354538+2242289	0.59			20.28 ± 0.22	7.1
1864	04 35 45.50	+22 36 59.8	0.68	09-OM-085					20.88 ± 0.42	4.4
1865	04 35 45.65	+22 40 22.3	0.63	09-OM-086	04354566+2240220	0.37			17.55 ± 0.01	66.8
1866	04 35 46.71	+22 36 05.9	0.63	09-OM-087	04354673+2236057	0.27			17.72 ± 0.02	61.2
1867	04 35 46.81	+24 18 04.6	0.75	12-OM-101	04354677+2418044	0.53			20.13 ± 0.15	4.4
1868	04 35 46.91	+22 36 38.6	0.62	09-OM-088	04354691+2236383	0.24			17.20 ± 0.01	87.4
1869	04 35 47.09	+22 32 11.8	0.68	09-OM-089	04354705+2232121	0.51			20.40 ± 0.10	6.8
1870	04 35 47.22	+23 01 22.8	0.96	08-OM-031	04354717+2301227	0.64			19.97 ± 0.39	4.8
1871	04 35 47.23	+22 32 38.6	0.62	09-OM-090	04354723+2232389	0.33			15.79 ± 0.01	200.2
1872	04 35 47.31	+24 20 50.2	0.78	12-OM-102	04354728+2420510	0.94			20.34 ± 0.22	3.5
1873	04 35 47.36	+22 50 20.6	0.81	08-OM-032	04354733+2250216	1.13	08-037	1.47	15.01 ± 0.04	148.8
1874	04 35 47.53	+22 35 43.5	0.65	09-OM-091	04354755+2235431	0.50			19.39 ± 0.04	16.4
1875	04 35 47.71	+22 34 22.2	0.68	09-OM-092					20.40 ± 0.09	6.6
1876	04 35 47.77	+22 33 54.2	0.68	09-OM-093	04354775+2233547	0.50			20.63 ± 0.06	5.5
1877	04 35 47.93	+22 32 37.7	0.65	09-OM-094	04354793+2232374	0.17			18.12 ± 0.05	45.2
1878	04 35 48.13	+22 37 10.8	0.67	09-OM-095	04354810+2237110	0.43			19.71 ± 0.06	12.3
1879	04 35 48.17	+22 48 10.2	0.92	08-OM-033	04354818+2248098	0.44			19.49 ± 0.20	6.6
1880	04 35 48.22	+22 48 10.2	0.66	09-OM-096	04354818+2248098	0.63			19.29 ± 0.08	17.5
1881	04 35 48.35	+22 39 22.8	0.64	09-OM-097	04354835+2239230	0.25			18.86 ± 0.02	23.9
1882	04 35 48.58	+22 35 34.8	0.65	09-OM-098	04354859+2235347	0.26			19.09 ± 0.07	21.1
1883	04 35 48.73	+22 40 28.6	0.63	09-OM-099	04354876+2240288	0.52			20.86 ± 0.11	12.4
1884	04 35 48.78	+22 35 48.1	0.66	09-OM-100	04354880+2235476	0.58			19.79 ± 0.06	11.6
1885	04 35 48.88	+22 40 42.4	0.64	09-OM-101	04354888+2240427	0.37			18.62 ± 0.01	29.0
1886	04 35 48.90	+22 33 14.4	0.67	09-OM-102	04354887+2233146	0.50			20.19 ± 0.20	7.5
1887	04 35 49.23	+24 20 35.8	0.76	12-OM-103	04354923+2420364	0.64			19.94 ± 0.13	5.0
1888	04 35 49.58	+22 34 23.4	0.62	09-OM-103	04354958+2234231	0.27			15.82 ± 0.00	196.4
1889	04 35 49.67	+22 37 32.5	0.67	09-OM-104	04354969+2237327	0.52			20.13 ± 0.07	8.4
1890	04 35 49.67	+22 43 49.7	0.67	09-OM-105	04354962+2243492	0.79			20.16 ± 0.09	8.2
1891	04 35 49.74	+22 32 30.6	0.68	09-OM-106					20.27 ± 0.10	7.6
1892	04 35 49.74	+22 31 33.0	0.66	09-OM-107	04354976+2231339	0.95			19.28 ± 0.11	18.1
1893	04 35 50.01	+22 33 28.8	0.68	09-OM-108					20.84 ± 0.15	4.4
1894	04 35 50.04	+22 34 43.0	0.62	09-OM-109	04355005+2234427	0.36			16.67 ± 0.01	121.1
1895	04 35 50.25	+24 18 15.1	0.76	12-OM-104	04355024+2418154	0.44			20.08 ± 0.16	4.5
1896	04 35 50.92	+22 38 25.9	0.67	09-OM-110	04355088+2238255	0.54			20.08 ± 0.15	8.3
1897	04 35 51.10	+22 52 39.7	0.92	08-OM-034	04355109+2252401	0.44	08-043	0.55	19.75 ± 0.13	4.8
1898	04 35 51.15	+22 39 19.3	0.67	09-OM-111					20.93 ± 0.48	3.8
1899	04 35 51.16	+22 46 17.2	0.96	08-OM-035	04355115+2246160	1.20			20.04 ± 0.24	4.0
1900	04 35 51.17	+22 46 16.6	0.68	09-OM-112	04355115+2246160	0.56			20.79 ± 0.08	4.6
1901	04 35 51.19	+22 43 06.0	0.68	09-OM-113	04355116+2243058	0.30	09-032	1.25	20.60 ± 0.18	5.3
1902	04 35 51.56	+22 32 05.1	0.68	09-OM-114	04355154+2232053	0.26			20.65 ± 0.19	5.1
1903	04 35 51.56	+22 35 54.9	0.66	09-OM-115	04355155+2235550	0.23			19.60 ± 0.05	13.7
1904	04 35 51.64	+24 19 51.0	0.70	12-OM-105	04355163+2419513	0.38			19.08 ± 0.04	10.9
1905	04 35 51.73	+22 44 25.3	0.67	09-OM-116	04355167+2244246	0.94			20.08 ± 0.08	8.9
1906	04 35 51.79	+22 40 17.5	0.66	09-OM-117	04355177+2240179	0.51			19.71 ± 0.06	11.0
1907	04 35 51.90	+22 41 00.9	0.65	09-OM-118	04355186+2241012	0.63			19.13 ± 0.05	18.4
1908	04 35 52.01	+22 35 06.2	0.68	09-OM-119	04355203+2235064	0.36			20.76 ± 0.07	4.9
1909	04 35 52.10	+22 32 48.7	0.65	09-OM-120	04355212+2232484	0.46			19.00 ± 0.03	22.8
1910	04 35 52.15	+22 45 53.1	0.68	09-OM-121	04355215+2245530	0.09			20.43 ± 0.20	6.1
1911	04 35 52.39	+22 33 35.8	0.62	09-OM-122	04355240+2233355	0.39			17.14 ± 0.01	90.4
1912	04 35 52.75	+22 44 58.1	0.63	09-OM-123	04355275+2244578	0.25			18.31 ± 0.03	39.2
1913	04 35 52.77	+22 54 22.7	0.86	08-OM-036	04355277+2254231	0.37	08-048	0.22	17.39 ± 0.04	33.3
1914	04 35 52.82	+24 23 08.4	0.74	12-OM-106	04355279+2423083	0.34			19.69 ± 0.10	6.4

Table A.1. (Continued)

#	RA _{corr} h m s	δ _{corr} ° ′ ″	Δ (''')	XEST OM	2MASS	ρ ₁ (''')	XEST	ρ ₂ (''')	Mag	Signif.
1915	04 35 52.88	+22 50 57.8	0.94	08-OM-037	04355286+2250585	0.76	08-049	1.11	20.06 ± 0.21	3.9
1916	04 35 52.89	+24 21 05.9	0.74	12-OM-107	04355287+2421065	0.68			19.47 ± 0.21	7.4
1917	04 35 53.10	+22 39 03.6	0.67	09-OM-124	04355310+2239034	0.18			20.36 ± 0.19	6.1
1918	04 35 53.45	+22 32 18.5	0.68	09-OM-125	04355350+2232180	0.90			20.78 ± 0.08	4.9
1919	04 35 53.52	+22 54 08.6	0.94	08-OM-038	04355349+2254089	0.46	08-051	0.50	18.21 ± 0.07	17.0
1920	04 35 53.73	+22 32 06.7	0.66	09-OM-126	04355372+2232068	0.17			19.50 ± 0.04	15.1
1921	04 35 53.75	+22 46 36.6	0.86	08-OM-039	04355376+2246368	0.37			18.33 ± 0.05	18.1
1922	04 35 53.76	+22 37 11.5	0.68	09-OM-127					20.72 ± 0.37	5.0
1923	04 35 53.80	+22 46 37.2	0.63	09-OM-128	04355376+2246368	0.54			18.35 ± 0.03	37.4
1924	04 35 54.08	+22 32 09.8	0.68	09-OM-129	04355412+2232086	1.26			20.65 ± 0.34	5.5
1925	04 35 54.10	+22 45 16.4	0.68	09-OM-130	04355415+2245157	0.90			21.07 ± 0.16	3.5
1926	04 35 54.16	+22 54 12.9	0.81	08-OM-040	04355415+2254134	0.60	08-051	0.39	13.63 ± 0.04	289.4
1927	04 35 54.30	+24 23 56.0	0.78	12-OM-108					20.35 ± 0.52	3.6
1928	04 35 54.54	+22 40 04.1	0.63	09-OM-131	04355451+2240041	0.28			17.68 ± 0.02	54.1
1929	04 35 54.68	+23 01 23.3	0.95	08-OM-041	04355467+2301233	0.11			19.71 ± 0.15	5.8
1930	04 35 54.68	+22 33 30.6	0.67	09-OM-132	04355465+2233307	0.35			20.19 ± 0.16	7.9
1931	04 35 54.81	+24 22 31.9	0.74	12-OM-109	04355477+2422318	0.50			19.52 ± 0.08	7.4
1932	04 35 54.87	+22 38 15.1	0.62	09-OM-133	04355488+2238151	0.27			13.31 ± 0.00	676.1
1933	04 35 55.01	+22 34 45.4	0.64	09-OM-134	04355500+2234449	0.37			18.73 ± 0.02	28.3
1934	04 35 55.25	+22 39 05.8	0.66	09-OM-135	04355520+2239063	0.83			19.86 ± 0.05	9.8
1935	04 35 55.56	+22 32 22.8	0.67	09-OM-136	04355539+2232220	2.49			20.08 ± 0.08	9.0
1936	04 35 55.71	+22 34 50.8	0.67	09-OM-137	04355571+2234505	0.31	09-037	0.43	20.03 ± 0.09	9.3
1937	04 35 55.73	+24 21 38.4	0.77	12-OM-110					20.44 ± 0.55	3.4
1938	04 35 55.76	+22 59 59.7	0.96	08-OM-042	04355577+2259593	0.46			20.06 ± 0.20	4.2
1939	04 35 55.93	+22 37 54.9	0.62	09-OM-138	04355591+2237550	0.24			15.52 ± 0.01	224.9
1940	04 35 55.97	+22 54 53.5	0.92	08-OM-043	04355594+2254537	0.41			19.76 ± 0.18	4.9
1941	04 35 56.09	+24 14 35.5	0.66	12-OM-111	04355613+2414356	0.58			18.02 ± 0.10	26.0
1942	04 35 56.84	+22 54 34.9	0.88	08-OM-044	04355684+2254360	1.16	08-058	2.47	18.94 ± 0.12	10.3
1943	04 35 57.32	+22 47 37.0	0.86	08-OM-045	04355733+2247366	0.39			18.58 ± 0.03	14.8
1944	04 35 57.36	+22 47 36.6	0.64	09-OM-139	04355733+2247366	0.47			18.58 ± 0.05	31.2
1945	04 35 57.61	+22 40 39.6	0.65	09-OM-140	04355763+2240403	0.85			20.05 ± 0.36	5.9
1946	04 35 57.81	+24 14 48.0	0.73	12-OM-112	04355779+2414484	0.51			19.81 ± 0.01	5.9
1947	04 35 57.90	+22 39 07.9	0.66	09-OM-141	04355790+2239073	0.56			19.95 ± 0.13	8.7
1948	04 35 58.16	+24 23 55.9	0.73	12-OM-113	04355808+2423561	1.04			19.73 ± 0.12	6.4
1949	04 35 58.52	+22 33 20.4	0.68	09-OM-142	04355854+2233210	0.79			20.69 ± 0.27	4.8
1950	04 35 58.93	+22 38 35.2	0.62	09-OM-143	04355892+2238353	0.16	09-042	0.70	15.37 ± 0.03	247.5
1951	04 35 58.94	+22 56 30.6	0.96	08-OM-046	04355893+2256302	0.39			20.14 ± 0.45	4.1
1952	04 35 58.97	+22 37 54.8	0.62	09-OM-144	04355896+2237550	0.21			17.11 ± 0.01	90.7
1953	04 35 59.02	+22 32 04.8	0.67	09-OM-145	04355898+2232051	0.63			19.82 ± 0.18	10.9
1954	04 35 59.13	+22 33 33.8	0.66	09-OM-146	04355911+2233337	0.20			19.42 ± 0.08	15.6
1955	04 35 59.40	+24 19 43.7	0.74	12-OM-114	04355942+2419439	0.51			19.77 ± 0.01	6.1
1956	04 35 59.53	+22 34 01.5	0.65	09-OM-147	04355941+2234005	1.85	09-043	1.74	19.08 ± 0.06	21.2
1957	04 35 59.88	+22 32 13.5	0.65	09-OM-148	04355986+2232131	0.36			19.06 ± 0.03	21.8
1958	04 36 00.24	+22 33 32.1	0.62	09-OM-149	04360025+2233319	0.27			16.14 ± 0.01	165.6
1959	04 36 00.93	+22 35 52.9	0.67	09-OM-150					20.02 ± 0.04	9.4
1960	04 36 00.98	+22 31 40.5	0.68	09-OM-151	04360093+2231405	0.69			20.57 ± 0.30	5.1
1961	04 36 01.00	+22 36 42.4	0.68	09-OM-152					20.51 ± 0.17	5.8
1962	04 36 01.16	+22 34 16.2	0.63	09-OM-153	04360117+2234163	0.32			17.67 ± 0.01	63.2
1963	04 36 01.20	+22 31 32.8	0.67	09-OM-154	04360117+2231322	0.72			19.81 ± 0.05	11.5
1964	04 36 01.30	+22 37 33.2	0.68	09-OM-155	04360136+2237329	0.90			21.27 ± 0.62	3.0
1965	04 36 01.53	+22 35 53.1	0.67	09-OM-156	04360152+2235533	0.32			19.86 ± 0.05	10.9
1966	04 36 02.24	+22 46 46.4	0.68	09-OM-157	04360218+2246461	0.85			20.58 ± 0.08	5.5
1967	04 36 02.40	+22 43 22.1	0.68	09-OM-158	04360245+2243225	0.87			20.64 ± 0.35	5.3
1968	04 36 02.41	+23 01 37.5	0.97	08-OM-047	04360233+2301370	1.08			20.10 ± 0.43	4.3
1969	04 36 02.51	+22 37 59.6	0.64	09-OM-159	04360249+2237593	0.33			18.60 ± 0.05	30.7
1970	04 36 02.55	+22 33 29.6	0.68	09-OM-160					20.65 ± 0.23	5.0
1971	04 36 02.90	+22 44 06.8	0.68	09-OM-161	04360285+2244064	0.71			20.47 ± 0.17	5.9
1972	04 36 02.91	+24 14 31.1	0.75	12-OM-115	04360297+2414316	1.09			19.85 ± 0.32	5.2

Table A.1. (Continued)

#	RA _{corr} h m s	δ _{corr} ° ′ ″	Δ ("")	XEST OM	2MASS	ρ ₁ ("")	XEST	ρ ₂ ("")	Mag	Signif.
1973	04 36 03.06	+23 01 43.9	0.97	08-OM-048	04360307+2301432	0.64			20.35 ± 0.13	3.4
1974	04 36 03.77	+22 37 00.4	0.66	09-OM-162	04360373+2237006	0.44			19.52 ± 0.02	14.4
1975	04 36 03.80	+22 47 47.9	0.96	08-OM-049	04360381+2247473	0.71			20.14 ± 0.20	3.8
1976	04 36 03.82	+22 40 15.2	0.67	09-OM-163	04360381+2240156	0.43			20.43 ± 0.23	5.6
1977	04 36 03.84	+22 47 47.2	0.68	09-OM-164	04360381+2247473	0.29			21.16 ± 0.56	3.4
1978	04 36 03.89	+22 34 03.4	0.68	09-OM-165					20.95 ± 0.03	4.1
1979	04 36 04.09	+23 01 51.9	0.97	08-OM-050	04360406+2301517	0.46			20.39 ± 0.02	3.3
1980	04 36 04.39	+22 38 07.3	0.67	09-OM-166	04360437+2238072	0.22			20.04 ± 0.05	9.1
1981	04 36 04.41	+22 31 53.7	0.67	09-OM-167					20.04 ± 0.12	9.2
1982	04 36 04.89	+22 37 39.8	0.67	09-OM-168	04360486+2237402	0.54			19.90 ± 0.16	9.8
1983	04 36 05.05	+22 54 25.9	0.96	08-OM-051	04360509+2254254	0.73			20.34 ± 0.05	3.4
1984	04 36 05.07	+22 38 13.5	0.67	09-OM-169	04360510+2238143	1.01			20.19 ± 0.03	8.0
1985	04 36 05.27	+22 36 39.5	0.64	09-OM-170	04360527+2236394	0.07			18.58 ± 0.02	31.7
1986	04 36 05.31	+22 41 31.2	0.66	09-OM-171	04360531+2241314	0.33			19.64 ± 0.07	12.3
1987	04 36 05.61	+22 35 39.1	0.67	09-OM-172					20.02 ± 0.14	9.1
1988	04 36 05.73	+22 33 15.8	0.62	09-OM-173	04360573+2233159	0.19			17.11 ± 0.01	92.1
1989	04 36 06.68	+22 35 27.5	0.64	09-OM-174	04360667+2235277	0.24			18.46 ± 0.05	34.9
1990	04 36 06.73	+22 38 12.0	0.68	09-OM-175	04360669+2238119	0.51			20.88 ± 0.43	4.3
1991	04 36 07.13	+22 33 18.5	0.66	09-OM-176	04360714+2233188	0.35			19.56 ± 0.10	13.9
1992	04 36 07.23	+22 55 10.4	0.96	08-OM-052	04360716+2255099	1.01			20.48 ± 0.61	3.0
1993	04 36 07.30	+22 54 33.1	0.90	08-OM-053	04360727+2254327	0.41			18.99 ± 0.09	11.0
1994	04 36 07.75	+22 43 03.1	0.63	09-OM-177	04360771+2243031	0.50			18.07 ± 0.04	46.3
1995	04 36 07.82	+22 40 33.0	0.67	09-OM-178	04360781+2240329	0.01			20.43 ± 0.18	6.0
1996	04 36 07.95	+22 31 57.1	0.62	09-OM-179	04360795+2231573	0.26			14.67 ± 0.00	354.6
1997	04 36 08.60	+23 01 48.3	0.91	08-OM-054	04360857+2301478	0.54			19.28 ± 0.15	8.4
1998	04 36 08.75	+22 33 07.5	0.63	09-OM-180	04360875+2233076	0.14			18.23 ± 0.02	42.1
1999	04 36 08.78	+22 43 05.1	0.67	09-OM-181	04360879+2243053	0.25			20.78 ± 0.09	4.6
2000	04 36 08.88	+22 48 47.8	0.94	08-OM-055	04360893+2248472	0.96			19.95 ± 0.13	4.6
2001	04 36 08.89	+22 39 37.2	0.68	09-OM-182	04360889+2239382	1.07			20.49 ± 0.28	5.5
2002	04 36 09.00	+22 48 46.6	0.67	09-OM-183	04360893+2248472	1.16			20.38 ± 0.04	6.7
2003	04 36 09.07	+22 35 06.9	0.64	09-OM-184	04360905+2235068	0.19			18.65 ± 0.04	30.2
2004	04 36 09.50	+22 32 11.8	0.66	09-OM-185	04360950+2232126	0.82			19.81 ± 0.10	11.3
2005	04 36 09.95	+22 44 01.5	0.67	09-OM-186	04360988+2244020	1.10			20.13 ± 0.14	8.1
2006	04 36 10.48	+22 56 31.6	0.96	08-OM-056	04361045+2256307	0.94			20.29 ± 0.52	3.6
2007	04 36 10.73	+22 37 54.0	0.68	09-OM-187	04361078+2237530	1.23	09-052	1.40	20.95 ± 0.46	4.1
2008	04 36 10.79	+22 35 37.8	0.67	09-OM-188	04361076+2235371	0.76			20.41 ± 0.22	6.1
2009	04 36 11.04	+22 46 28.9	0.68	09-OM-189	04361098+2246290	0.76			20.78 ± 0.23	4.3
2010	04 36 11.16	+22 36 18.8	0.62	09-OM-190	04361116+2236188	0.17			14.81 ± 0.01	331.3
2011	04 36 11.22	+22 42 20.0	0.68	09-OM-191	04361119+2242201	0.38			21.21 ± 0.60	3.1
2012	04 36 11.36	+22 39 21.3	0.62	09-OM-192	04361135+2239211	0.15			16.87 ± 0.01	106.3
2013	04 36 12.27	+22 33 07.1	0.67	09-OM-193	04361229+2233079	0.83			20.10 ± 0.08	8.9
2014	04 36 12.57	+22 46 56.0	0.93	08-OM-057	04361258+2246558	0.35			19.57 ± 0.26	6.0
2015	04 36 12.63	+22 46 55.5	0.66	09-OM-194	04361258+2246558	0.71			19.73 ± 0.06	11.8
2016	04 36 13.04	+23 02 02.2	0.87	08-OM-058	04361300+2302015	0.77			18.60 ± 0.08	15.1
2017	04 36 13.40	+22 46 00.6	0.66	09-OM-195	04361340+2246012	0.62			19.72 ± 0.12	11.7
2018	04 36 13.41	+22 32 20.3	0.64	09-OM-196	04361339+2232206	0.34			18.69 ± 0.03	29.5
2019	04 36 13.45	+22 35 20.9	0.67	09-OM-197	04361345+2235209	0.08			19.69 ± 0.14	12.2
2020	04 36 13.56	+22 48 24.6	0.68	09-OM-198	04361353+2248245	0.39			21.02 ± 0.49	3.8
2021	04 36 13.74	+22 41 30.4	0.64	09-OM-199	04361375+2241305	0.32			18.73 ± 0.05	27.5
2022	04 36 13.91	+22 42 48.8	0.63	09-OM-200	04361389+2242486	0.24			17.92 ± 0.02	51.8
2023	04 36 14.24	+22 39 11.1	0.66	09-OM-201	04361424+2239111	0.10			19.77 ± 0.18	11.0
2024	04 36 14.24	+22 53 30.2	0.96	08-OM-059	04361425+2253298	0.44			20.03 ± 0.32	4.0
2025	04 36 14.31	+22 32 09.9	0.65	09-OM-202	04361434+2232096	0.64			19.13 ± 0.03	20.7
2026	04 36 14.36	+22 34 05.7	0.64	09-OM-203	04361435+2234054	0.23			18.52 ± 0.03	33.5
2027	04 36 14.53	+22 40 29.7	0.68	09-OM-204	04361450+2240300	0.45			20.76 ± 0.00	4.8
2028	04 36 14.64	+22 35 48.0	0.68	09-OM-205	04361471+2235481	1.07			20.72 ± 0.01	5.1
2029	04 36 14.67	+22 33 01.2	0.62	09-OM-206	04361467+2233012	0.11			17.06 ± 0.01	95.5
2030	04 36 14.79	+22 35 48.1	0.68	09-OM-207					20.72 ± 0.30	4.5

Table A.1. (Continued)

#	RA _{corr} h m s	δ _{corr} ° ′ ″	Δ (")	XEST OM	2MASS	ρ ₁ (")	XEST	ρ ₂ (")	Mag	Signif.
2031	04 36 15.07	+22 33 47.2	0.68	09-OM-208	04361502+2233471	0.54			20.62 ± 0.31	4.8
2032	04 36 15.17	+22 35 22.0	0.64	09-OM-209	04361519+2235221	0.42			18.57 ± 0.02	31.7
2033	04 36 15.40	+22 42 43.9	0.62	09-OM-210	04361537+2242438	0.35			17.21 ± 0.01	85.5
2034	04 36 15.54	+22 32 22.2	0.66	09-OM-211	04361550+2232209	1.30			19.26 ± 0.04	18.5
2035	04 36 16.08	+22 44 16.8	0.65	09-OM-212	04361605+2244167	0.31			19.05 ± 0.03	21.2
2036	04 36 16.43	+22 35 38.1	0.65	09-OM-213	04361643+2235382	0.12			19.23 ± 0.04	18.6
2037	04 36 16.53	+22 33 00.3	0.62	09-OM-214	04361656+2233003	0.43			15.77 ± 0.01	202.5
2038	04 36 16.58	+22 46 16.2	0.66	09-OM-215	04361652+2246169	1.08			19.74 ± 0.07	11.6
2039	04 36 16.69	+22 56 51.9	0.94	08-OM-060	04361671+2256520	0.49			19.75 ± 0.14	5.5
2040	04 36 16.80	+22 43 11.3	0.68	09-OM-216					21.29 ± 0.63	3.0
2041	04 36 16.80	+22 34 24.2	0.68	09-OM-217	04361683+2234244	0.52			20.25 ± 0.10	7.6
2042	04 36 16.95	+22 39 56.6	0.67	09-OM-218	04361695+2239566	0.16			20.45 ± 0.12	6.2
2043	04 36 17.00	+22 40 35.5	0.65	09-OM-219	04361697+2240358	0.55			19.32 ± 0.07	16.6
2044	04 36 17.18	+22 45 06.6	0.65	09-OM-220	04361713+2245067	0.63			19.32 ± 0.14	16.3
2045	04 36 17.46	+22 48 24.1	0.96	08-OM-061	04361745+2248244	0.38			20.34 ± 0.55	3.4
2046	04 36 17.47	+22 39 13.4	0.63	09-OM-221	04361747+2239135	0.13			17.90 ± 0.02	52.8
2047	04 36 17.52	+22 48 23.7	0.68	09-OM-222	04361745+2248244	1.15			20.73 ± 0.13	4.8
2048	04 36 17.55	+22 37 18.4	0.68	09-OM-223	04361759+2237183	0.65			20.85 ± 0.21	4.3
2049	04 36 17.70	+22 47 12.5	0.81	08-OM-062	04361769+2247125	0.11			15.82 ± 0.01	97.0
2050	04 36 17.72	+22 47 12.4	0.62	09-OM-224	04361769+2247125	0.32			15.76 ± 0.00	202.2
2051	04 36 17.95	+22 37 33.5	0.63	09-OM-225	04361794+2237334	0.11			18.14 ± 0.03	44.7
2052	04 36 18.04	+22 40 27.0	0.66	09-OM-226	04361802+2240269	0.23			19.44 ± 0.17	14.6
2053	04 36 18.05	+22 40 35.8	0.62	09-OM-227	04361805+2240357	0.16			15.52 ± 0.00	230.2
2054	04 36 18.30	+22 49 51.2	0.94	08-OM-063	04361833+2249509	0.55			19.91 ± 0.17	4.6
2055	04 36 18.47	+22 39 30.9	0.66	09-OM-228	04361847+2239308	0.12			19.47 ± 0.09	14.5
2056	04 36 18.54	+22 35 23.1	0.68	09-OM-229					20.22 ± 0.14	7.7
2057	04 36 18.97	+22 39 18.4	0.62	09-OM-230	04361898+2239184	0.17			16.38 ± 0.01	143.1
2058	04 36 19.52	+22 32 47.5	0.68	09-OM-231					20.93 ± 0.43	4.3
2059	04 36 19.63	+22 43 58.8	0.64	09-OM-232	04361960+2243585	0.39			18.85 ± 0.04	24.9
2060	04 36 19.63	+22 41 26.9	0.62	09-OM-233	04361964+2241269	0.14			16.82 ± 0.00	110.2
2061	04 36 19.80	+22 37 09.2	0.68	09-OM-234	04361982+2237095	0.59	09-063	0.29	20.93 ± 0.44	4.2
2062	04 36 20.00	+22 39 26.8	0.62	09-OM-235	04361998+2239277	0.92			16.62 ± 0.01	124.0
2063	04 36 20.46	+22 36 34.8	0.65	09-OM-236	04362046+2236346	0.14			19.24 ± 0.08	18.3
2064	04 36 20.50	+22 36 47.0	0.68	09-OM-237					20.58 ± 0.10	5.7
2065	04 36 20.89	+22 38 31.2	0.68	09-OM-238	04362090+2238309	0.32			20.47 ± 0.11	6.2
2066	04 36 21.91	+22 43 43.6	0.68	09-OM-239	04362188+2243435	0.37			20.94 ± 0.46	4.0
2067	04 36 22.39	+22 51 57.3	0.95	08-OM-064	04362239+2251572	0.01			19.97 ± 0.19	4.3
2068	04 36 22.52	+22 42 24.7	0.65	09-OM-240	04362251+2242245	0.17			19.18 ± 0.05	19.1
2069	04 36 23.13	+22 33 22.1	0.64	09-OM-241	04362316+2233225	0.55			18.32 ± 0.00	39.6
2070	04 36 23.45	+22 52 17.0	0.81	08-OM-065	04362344+2252171	0.16			15.29 ± 0.01	128.8
2071	04 36 23.48	+22 47 36.5	0.83	08-OM-066	04362350+2247362	0.42			17.88 ± 0.02	26.2
2072	04 36 23.53	+22 47 36.5	0.63	09-OM-242	04362350+2247362	0.48			17.83 ± 0.03	55.1
2073	04 36 23.74	+22 38 11.8	0.68	09-OM-243	04362375+2238112	0.64			20.38 ± 0.09	6.7
2074	04 36 23.89	+22 39 08.8	0.67	09-OM-244	04362389+2239094	0.68			19.80 ± 0.18	10.6
2075	04 36 25.49	+22 42 13.7	0.63	09-OM-245	04362549+2242135	0.17			17.61 ± 0.02	65.0
2076	04 36 25.49	+22 40 12.7	0.62	09-OM-246	04362551+2240128	0.38			14.53 ± 0.00	379.0
2077	04 36 25.62	+22 33 32.4	0.68	09-OM-247	04362561+2233328	0.52			20.32 ± 0.21	6.7
2078	04 36 25.74	+22 38 55.3	0.66	09-OM-248	04362577+2238552	0.50			19.86 ± 0.09	10.6
2079	04 36 25.80	+22 41 01.0	0.65	09-OM-249	04362577+2241010	0.26			19.25 ± 0.07	17.9
2080	04 36 26.25	+22 33 58.3	0.68	09-OM-250					20.65 ± 0.24	5.1
2081	04 36 26.36	+22 35 11.3	0.68	09-OM-251	04362637+2235109	0.32			20.66 ± 0.04	5.4
2082	04 36 26.66	+22 39 35.9	0.67	09-OM-252	04362668+2239359	0.35			19.95 ± 0.09	9.7
2083	04 36 26.69	+22 37 51.7	0.63	09-OM-253	04362671+2237518	0.39			17.86 ± 0.03	54.8
2084	04 36 26.88	+22 46 43.2	0.94	08-OM-067	04362700+2246429	1.70			19.70 ± 0.24	5.1
2085	04 36 27.02	+22 46 42.6	0.67	09-OM-254	04362700+2246429	0.40			20.00 ± 0.23	8.7
2086	04 36 27.07	+22 36 22.9	0.67	09-OM-255	04362707+2236237	0.86			19.94 ± 0.08	10.1
2087	04 36 27.07	+22 45 04.0	0.68	09-OM-256	04362709+2245052	1.26			20.53 ± 0.17	5.6
2088	04 36 27.14	+22 33 18.3	0.63	09-OM-257	04362717+2233184	0.46			17.37 ± 0.01	78.2

Table A.1. (Continued)

#	RA _{corr} h m s	δ_{corr} ° ′ ″	Δ (")	XEST OM	2MASS	ρ_1 (")	XEST	ρ_2 (")	Mag	Signif.
2089	04 36 27.22	+22 41 35.4	0.68	09-OM-258	04362721+2241362	0.77			20.75 ± 0.38	4.8
2090	04 36 27.63	+22 32 59.4	0.65	09-OM-259	04362767+2232593	0.59			19.19 ± 0.03	19.5
2091	04 36 27.65	+22 32 39.8	0.63	09-OM-260	04362767+2232398	0.36			17.91 ± 0.02	53.5
2092	04 36 27.81	+22 36 07.2	0.65	09-OM-261	04362782+2236073	0.15			18.89 ± 0.02	24.8
2093	04 36 27.86	+22 42 18.2	0.68	09-OM-262	04362787+2242172	0.96			20.56 ± 0.20	5.5
2094	04 36 27.94	+22 32 50.2	0.67	09-OM-263	04362794+2232498	0.35			20.27 ± 0.12	7.5
2095	04 36 27.94	+22 42 07.1	0.65	09-OM-264	04362794+2242075	0.43			19.19 ± 0.05	18.8
2096	04 36 28.02	+22 44 34.3	0.68	09-OM-265	04362805+2244343	0.51			21.11 ± 0.53	3.5
2097	04 36 28.07	+22 46 36.6	0.64	09-OM-266	04362812+2246365	0.77			19.63 ± 0.07	27.7
2098	04 36 28.10	+22 46 37.0	0.83	08-OM-068	04362812+2246365	0.61			19.30 ± 0.06	16.9
2099	04 36 28.10	+22 33 48.9	0.68	09-OM-267	04362810+2233488	0.01			20.88 ± 0.41	4.5
2100	04 36 28.17	+22 35 06.3	0.68	09-OM-268	04362817+2235064	0.13			20.56 ± 0.13	5.8
2101	04 36 28.28	+22 39 14.1	0.63	09-OM-269	04362831+2239140	0.38			17.60 ± 0.02	65.3
2102	04 36 29.14	+22 34 12.6	0.67	09-OM-270	04362906+2234134	1.35			19.64 ± 0.12	12.7
2103	04 36 29.52	+22 38 43.8	0.68	09-OM-271	04362951+2238434	0.38			20.72 ± 0.05	5.0
2104	04 36 29.54	+22 35 17.8	0.68	09-OM-272	04362946+2235189	1.61			21.05 ± 0.49	3.8
2105	04 36 29.96	+22 38 13.8	0.67	09-OM-273	04362995+2238147	0.87			20.06 ± 0.03	9.1
2106	04 36 29.97	+22 34 18.0	0.62	09-OM-274	04362998+2234182	0.39			14.84 ± 0.00	327.1
2107	04 36 30.92	+22 34 33.7	0.66	09-OM-275	04363099+2234343	1.15			19.70 ± 0.11	12.2
2108	04 36 31.24	+22 36 47.8	0.63	09-OM-276	04363124+2236481	0.36			17.83 ± 0.04	56.3
2109	04 36 31.49	+22 40 09.7	0.67	09-OM-277	04363150+2240097	0.20			20.26 ± 0.20	7.0
2110	04 36 32.96	+22 34 10.9	0.68	09-OM-278					20.45 ± 0.18	6.1
2111	04 36 33.84	+22 34 55.3	0.64	09-OM-279	04363385+2234558	0.54			18.77 ± 0.04	27.5
2112	04 36 34.82	+22 35 41.2	0.63	09-OM-280	04363487+2235409	0.78			19.59 ± 0.08	29.7
2113	04 36 35.10	+22 32 55.1	0.68	09-OM-281					20.85 ± 0.37	4.3
2114	04 36 35.21	+22 33 00.0	0.67	09-OM-282	04363523+2233005	0.58			19.84 ± 0.15	10.4
2115	04 39 09.60	+25 44 30.7	0.53	05-OM-001	04390959+2544307	0.11			18.03 ± 0.03	47.9
2116	04 39 20.87	+25 45 02.8	0.52	05-OM-002	04392090+2545021	0.89	05-013	2.10	17.22 ± 0.11	83.5
2117	04 40 06.76	+25 36 45.7	0.53	05-OM-003	04400675+2536457	0.08	05-029	0.64	17.28 ± 0.03	81.9
2118	04 40 09.20	+25 35 32.7	0.52	05-OM-004	04400920+2535326	0.06	05-031	0.13	13.00 ± 0.01	757.9
2119	04 40 38.28	+25 54 26.9	1.04	07-OM-001	04403830+2554274	0.65			20.53 ± 0.22	4.8
2120	04 40 42.16	+25 52 40.8	1.03	07-OM-002	04404215+2552403	0.50			19.50 ± 0.06	12.0
2121	04 40 44.78	+25 44 33.8	1.04	07-OM-003	04404477+2544339	0.17			20.79 ± 0.21	4.2
2122	04 40 47.68	+25 40 21.3	1.04	07-OM-004	04404774+2540213	0.97			20.30 ± 0.39	5.6
2123	04 40 49.24	+25 41 14.9	1.03	07-OM-005	04404915+2541146	1.19			20.49 ± 0.06	6.5
2124	04 40 49.61	+25 51 19.2	1.00	07-OM-006	04404950+2551191	1.35	07-011	1.12	18.25 ± 0.04	37.7
2125	04 41 02.70	+25 39 47.7	1.09	07-OM-007	04410274+2539470	0.89			20.18 ± 0.36	5.1
2126	04 41 10.28	+25 39 32.8	1.04	07-OM-008	04411028+2539342	1.45			20.96 ± 0.42	4.4
2127	04 41 24.69	+25 54 48.7	0.99	07-OM-009	04412472+2554484	0.60	07-030	0.58	12.64 ± 0.00	540.7
2128	04 41 36.33	+25 53 59.5	1.03	07-OM-010	04413634+2554007	1.23			21.27 ± 0.59	3.1
2129	04 41 37.16	+25 55 24.2	1.03	07-OM-011	04413712+2555239	0.45			20.93 ± 0.17	4.1
2130	04 41 44.58	+25 52 45.3	1.03	07-OM-012	04414450+2552450	1.03			20.88 ± 0.11	4.4
2131	04 41 47.31	+25 50 35.4	1.04	07-OM-013	04414734+2550361	0.93			20.09 ± 0.09	7.2
2132	04 41 55.30	+25 15 09.6	0.77	10-OM-001	04415533+2515092	0.65			20.33 ± 0.44	4.3
2133	04 42 05.46	+25 22 56.0	0.67	10-OM-002	04420548+2522562	0.48	10-017	0.33	18.68 ± 0.06	17.2
2134	04 42 07.33	+25 23 03.8	0.70	10-OM-003	04420732+2523032	0.55	10-018	0.50	19.09 ± 0.15	11.9
2135	04 42 07.77	+25 23 12.3	0.64	10-OM-004	04420777+2523118	0.52	10-020	0.71	17.90 ± 0.08	31.2
2136	04 42 18.42	+25 16 53.5	0.77	10-OM-005	04421841+2516532	0.19			20.54 ± 0.53	3.5
2137	04 42 21.06	+25 20 34.1	0.77	10-OM-006	04422101+2520343	0.66	10-034	1.56	18.67 ± 0.09	15.5
2138	04 42 28.26	+25 24 35.7	0.76	10-OM-007	04422817+2524357	1.12			20.13 ± 0.32	4.4
2139	04 42 35.22	+25 20 04.8	0.74	10-OM-008	04423521+2520046	0.19			19.86 ± 0.18	5.9
2140	04 42 35.74	+25 27 15.7	0.69	10-OM-009	04423570+2527152	0.72			19.15 ± 0.16	11.0
2141	04 42 37.66	+25 15 37.2	0.61	10-OM-010	04423769+2515374	0.60	10-045	0.94	15.84 ± 0.03	115.5
2142	04 42 43.13	+25 21 48.7	0.72	10-OM-011	04424314+2521490	0.38			19.53 ± 0.21	7.5
2143	04 42 46.69	+25 13 57.4	0.76	10-OM-012	04424669+2513569	0.48			20.45 ± 0.20	3.7
2144	04 42 46.94	+25 27 20.3	0.74	10-OM-013	04424694+2527203	0.02			19.94 ± 0.10	5.7
2145	04 42 50.61	+25 22 53.6	0.65	10-OM-014	04425062+2522534	0.17			18.27 ± 0.01	23.7
2146	04 42 53.54	+25 29 04.8	0.74	10-OM-015	04425351+2529057	0.98			19.90 ± 0.12	5.9

Table A.1. (Continued)

#	RA _{corr} h m s	δ _{corr} ° ' "	Δ (")	XEST OM	2MASS	ρ ₁ (")	XEST	ρ ₂ (")	Mag	Signif.
2147	04 42 55.07	+25 16 35.2	0.61	10-OM-016	04425508+2516360	0.81			15.32 ± 0.01	153.1
2148	04 42 58.66	+25 15 29.4	0.73	10-OM-017	04425863+2515295	0.36			19.81 ± 0.15	6.6

^a *U*-band except if identified with [†] (UVW1) or [‡] (UVW2).

Appendix B: X-ray and OM light curves

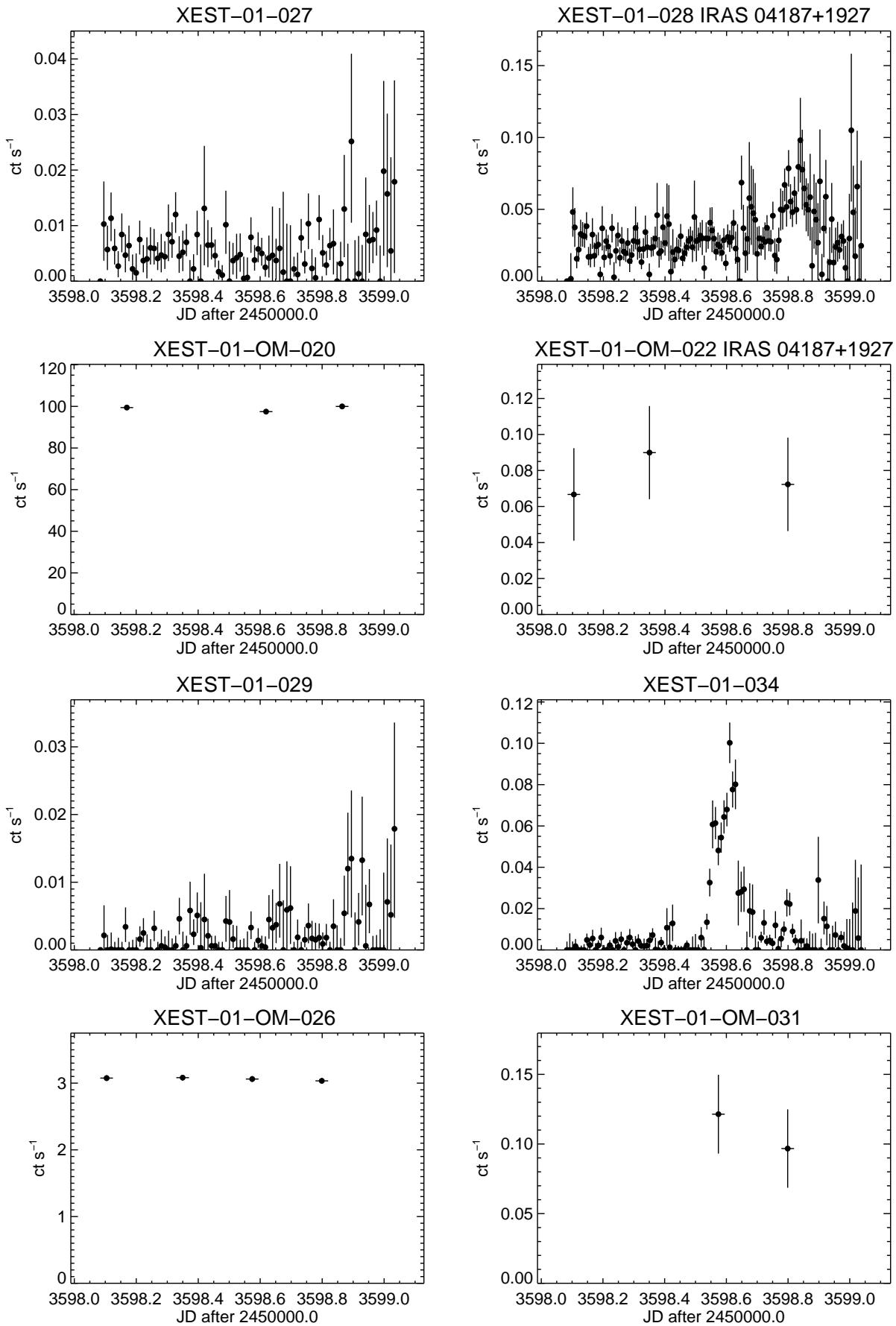


Fig. B.1. Light curves.

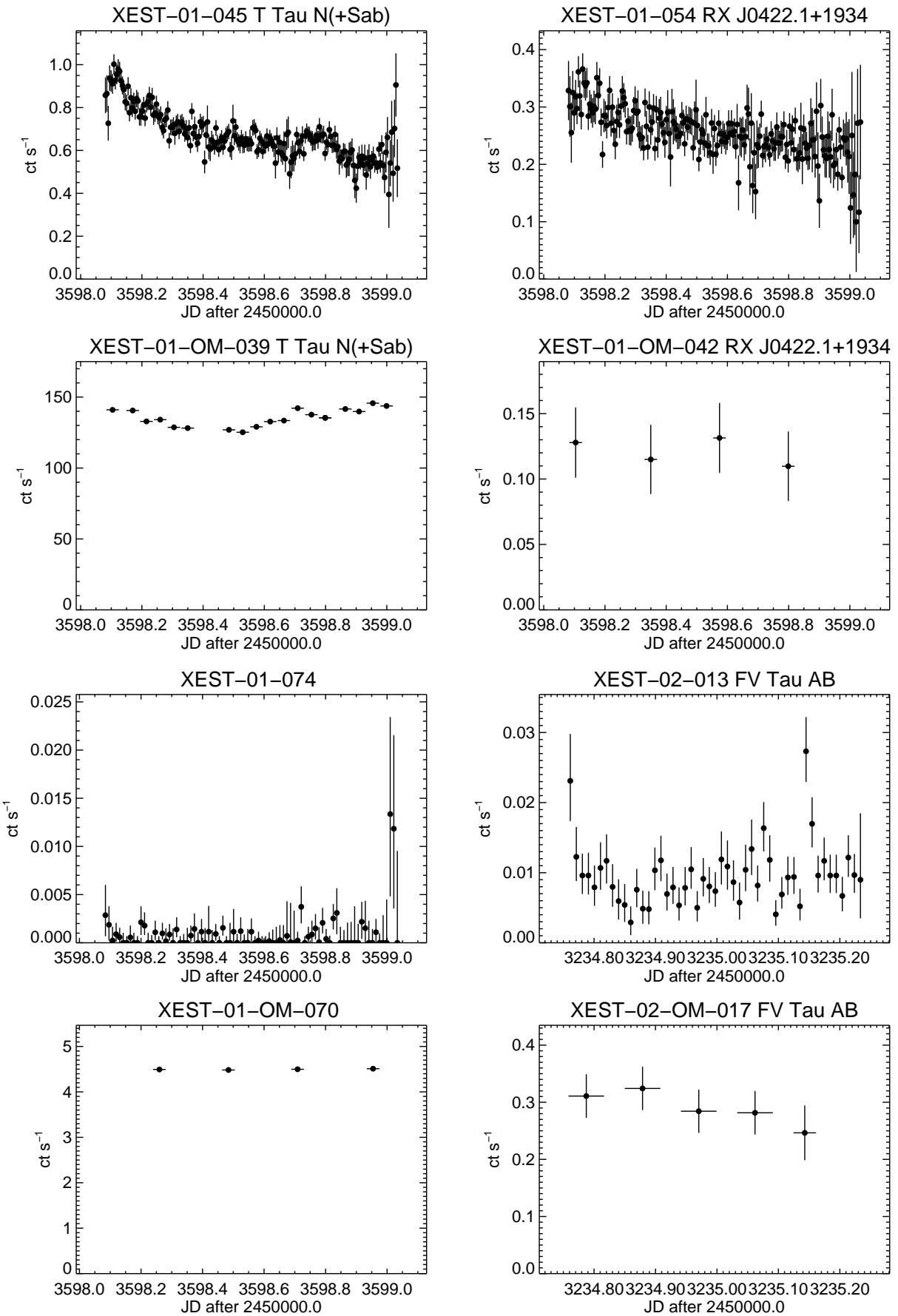


Fig. B.1. Light curves (continued).

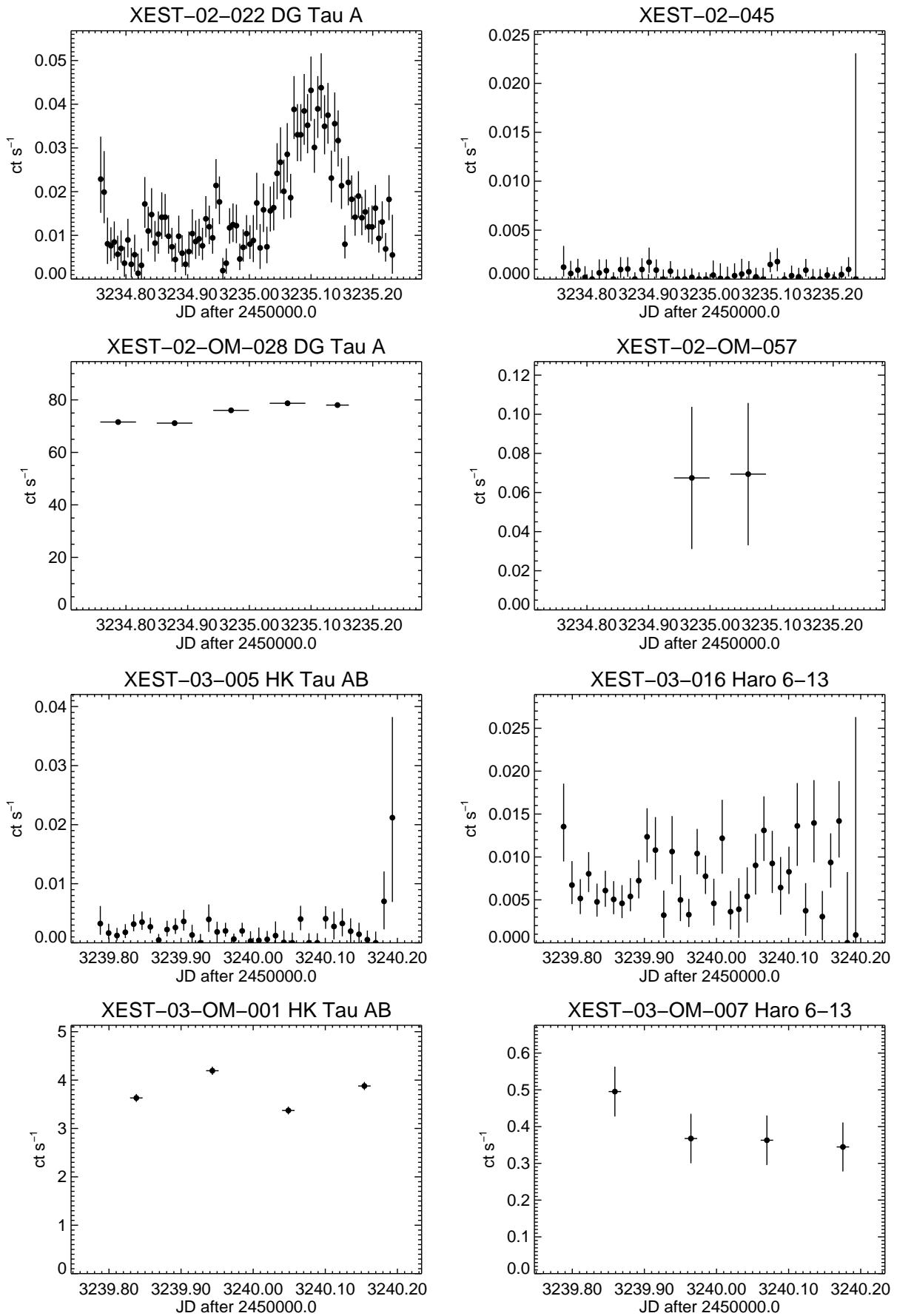


Fig. B.1. Light curves (continued).

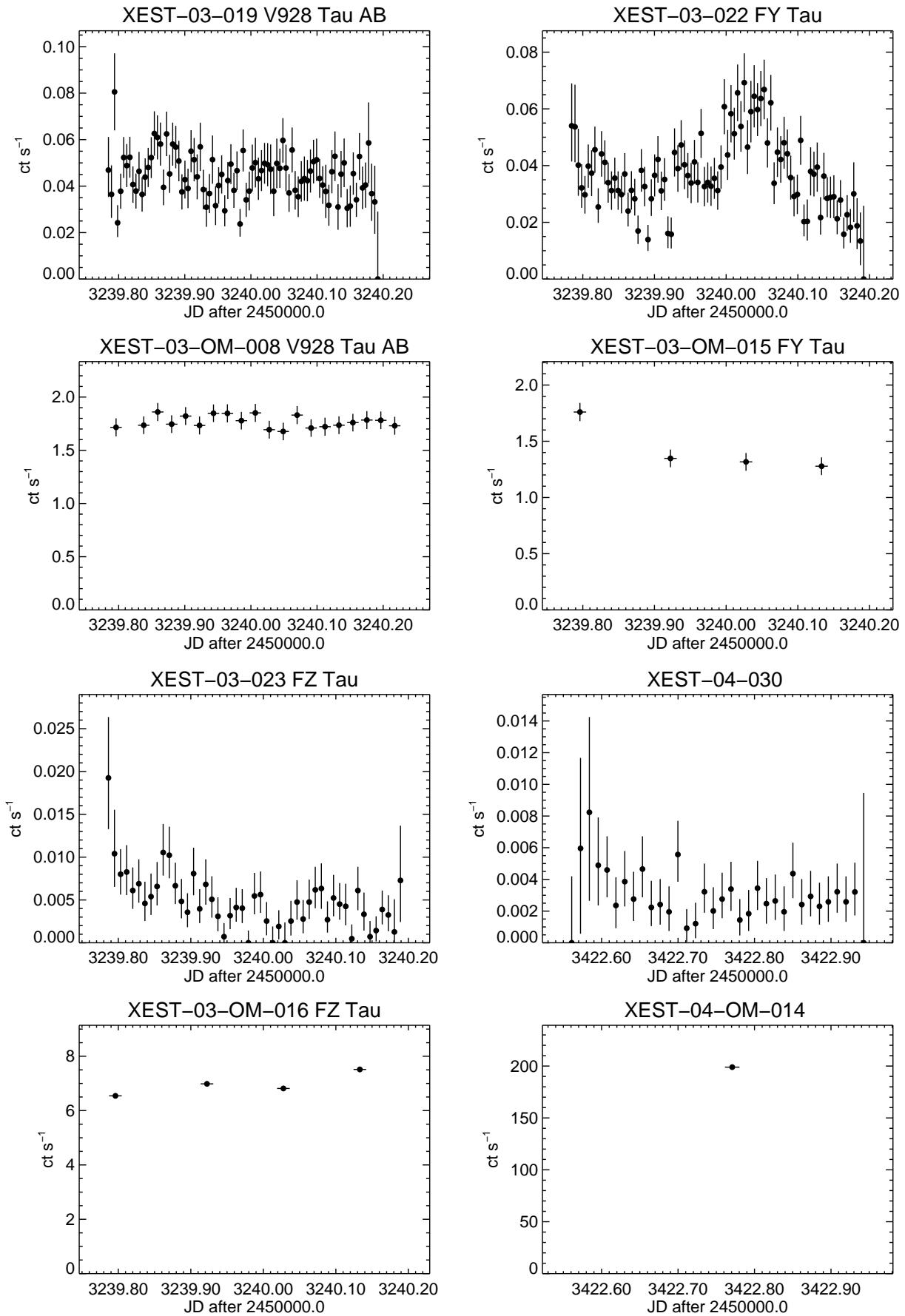


Fig. B.1. Light curves (continued).

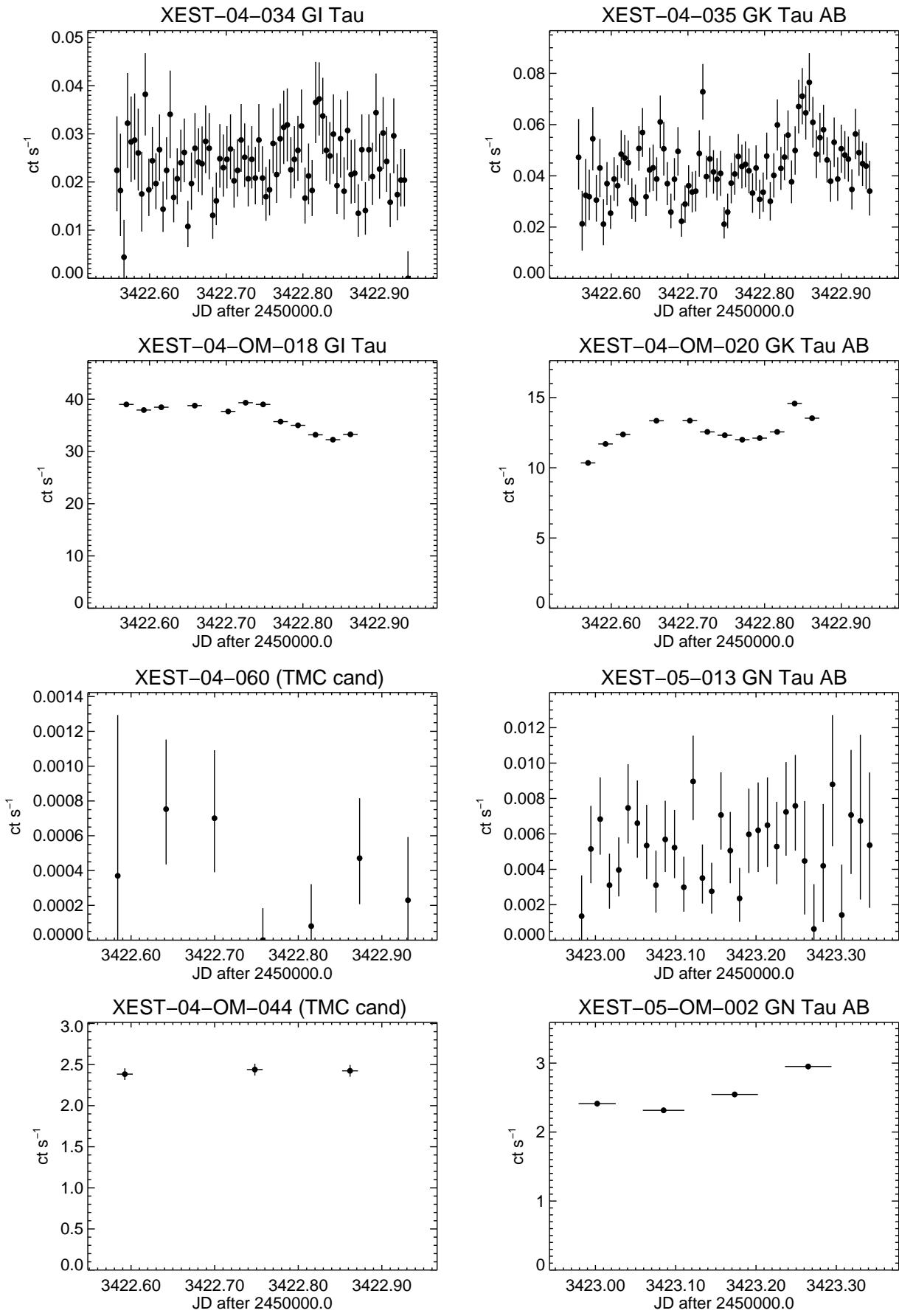


Fig. B.1. Light curves (continued).

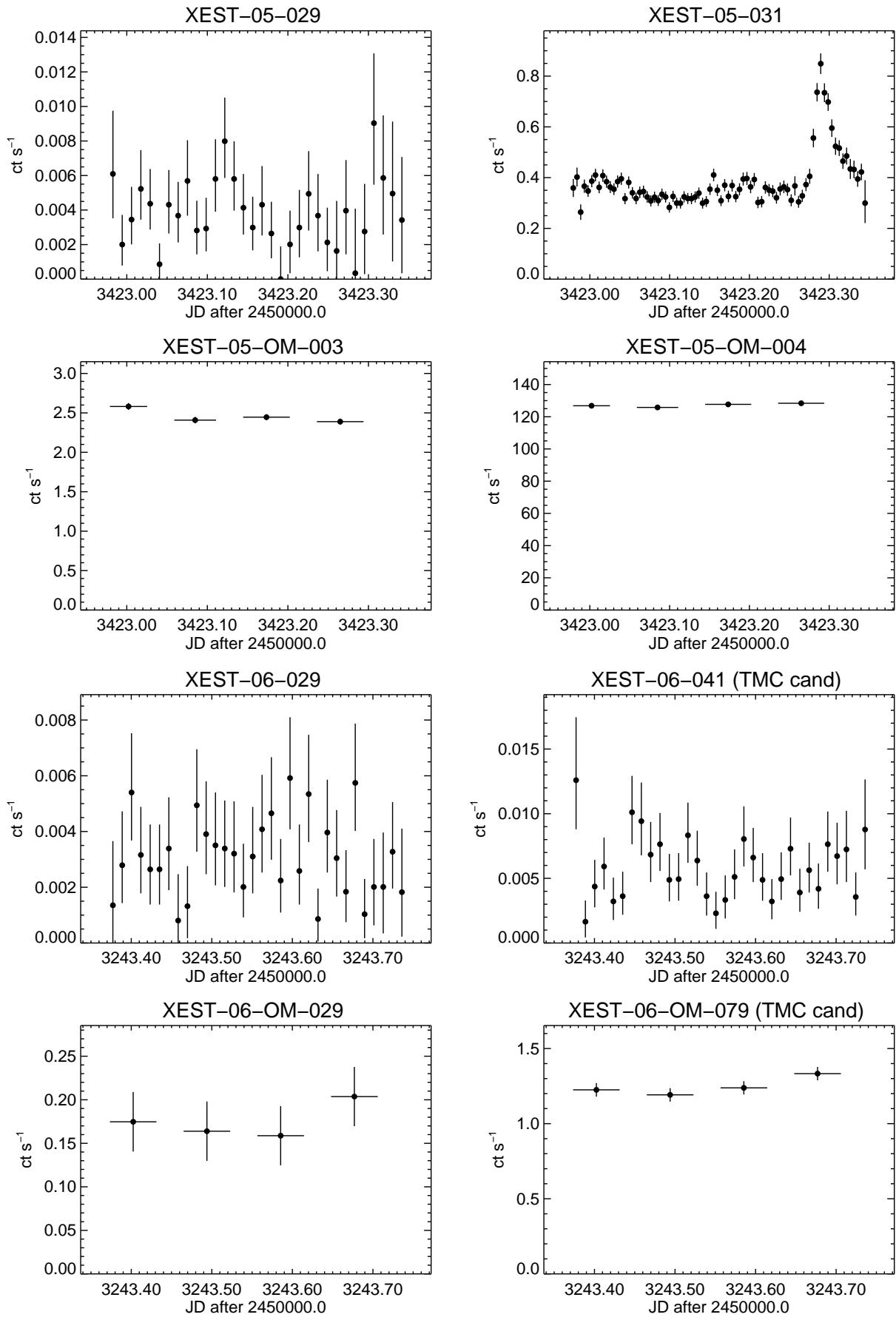
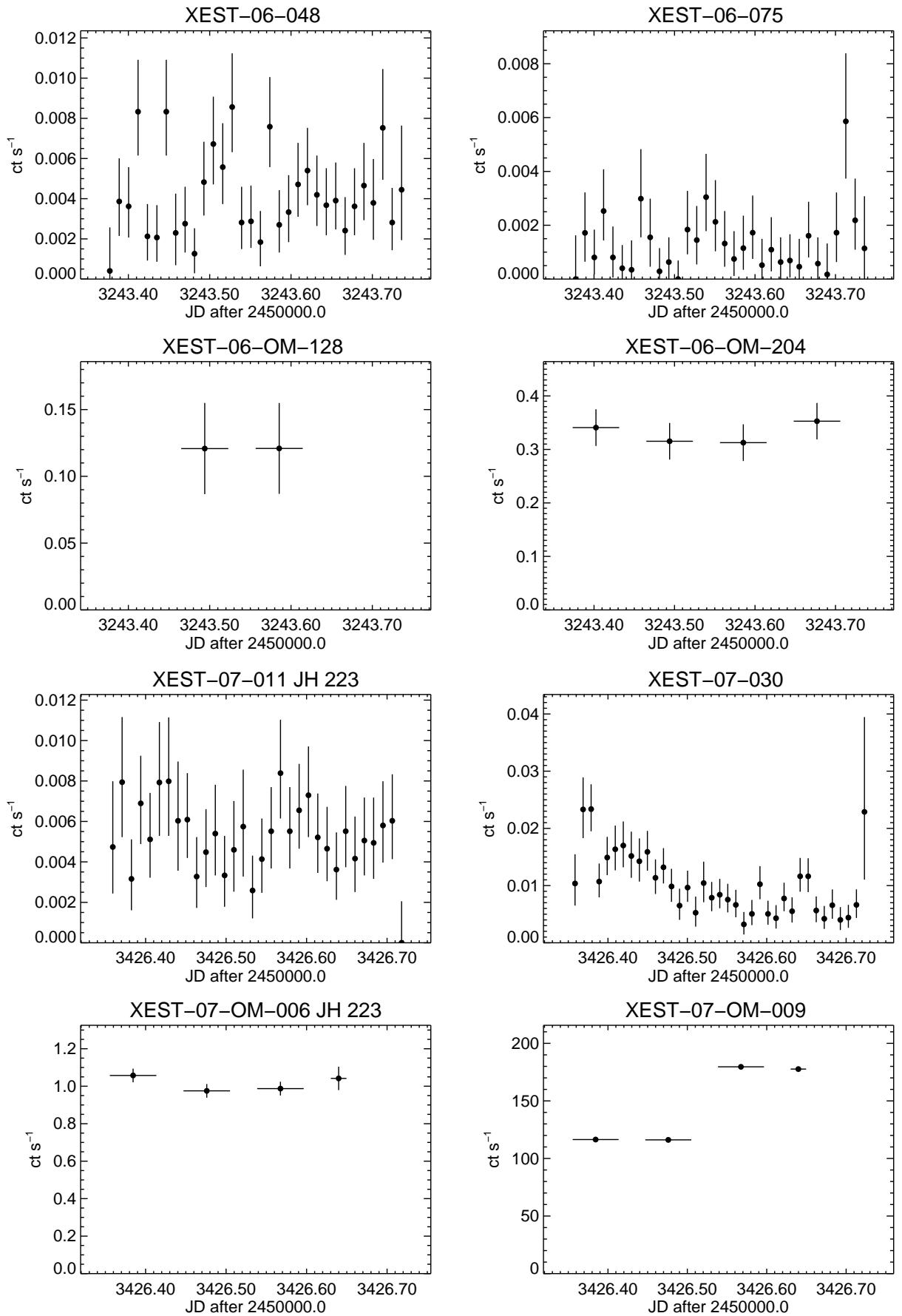


Fig. B.1. Light curves (continued).

**Fig. B.1.** Light curves (continued).

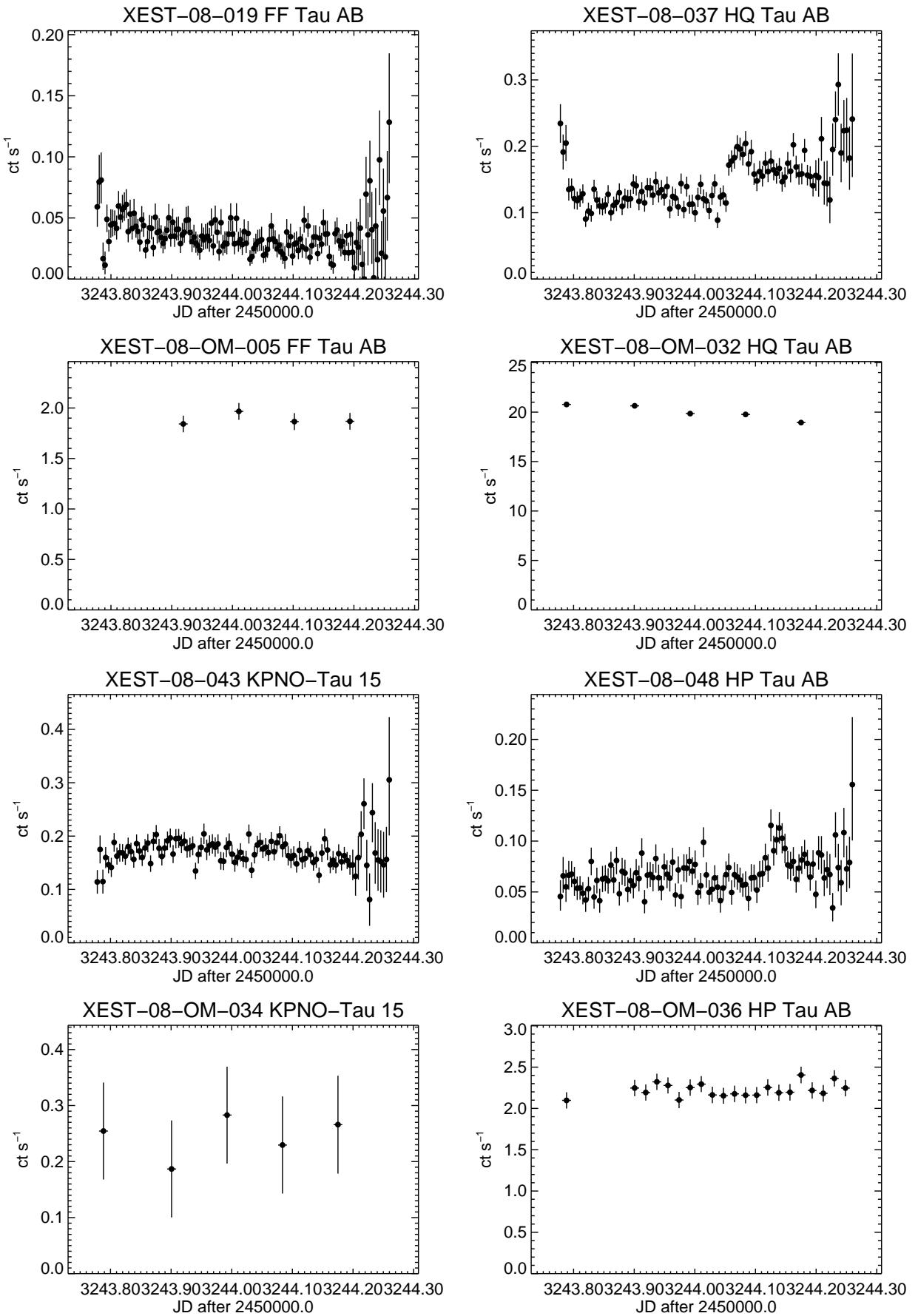


Fig. B.1. Light curves (continued).

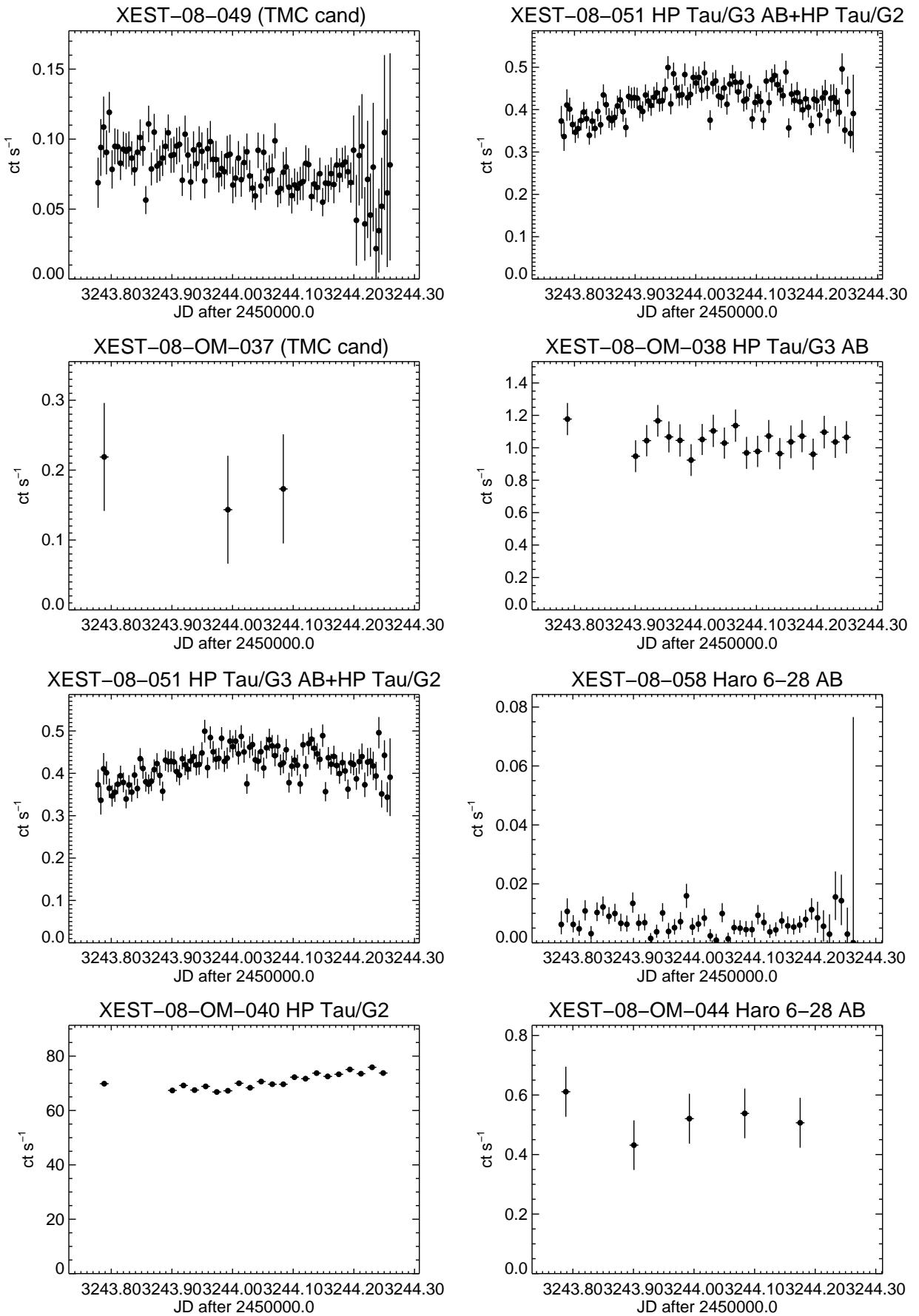
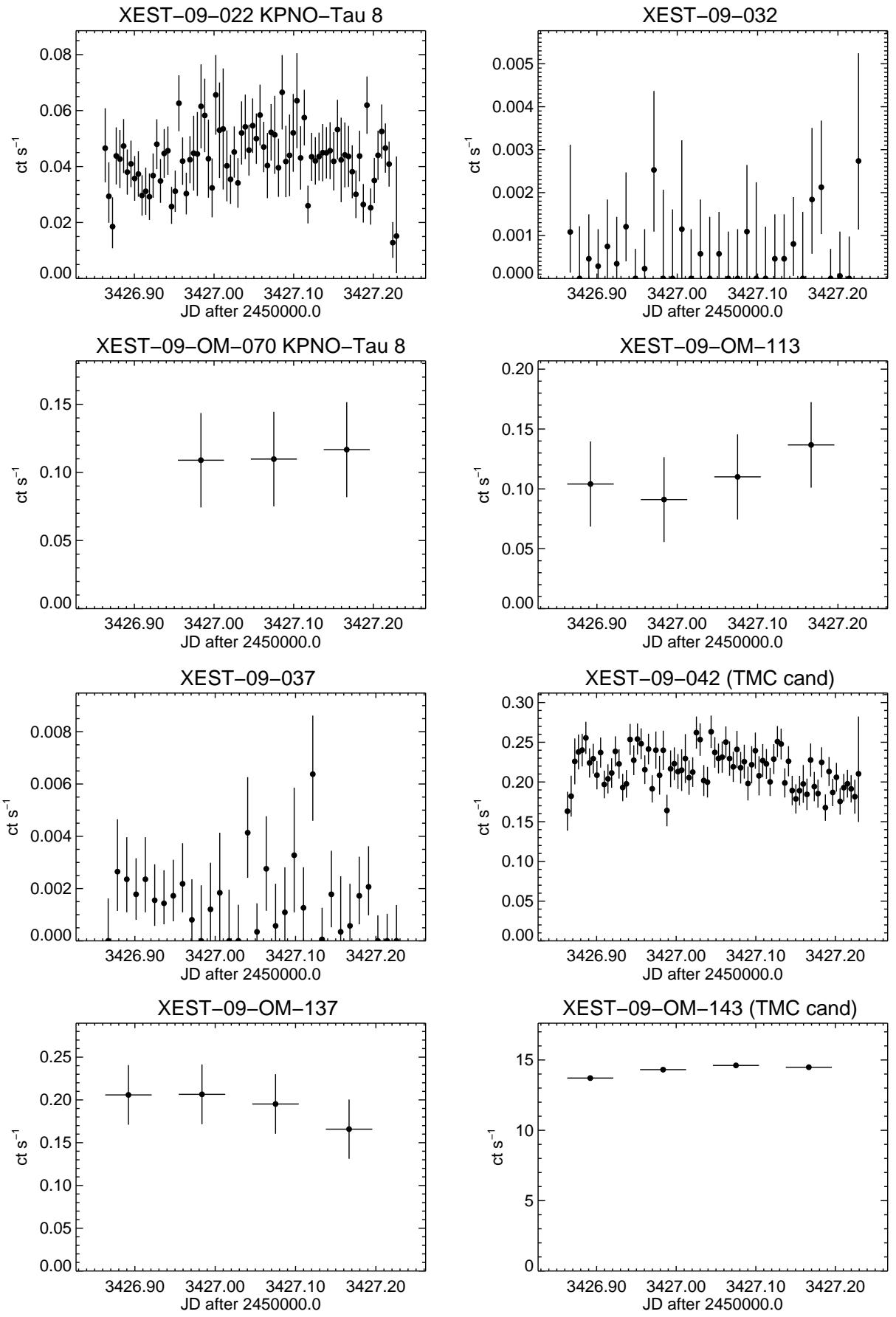


Fig. B.1. Light curves (continued).

**Fig. B.1.** Light curves (continued).

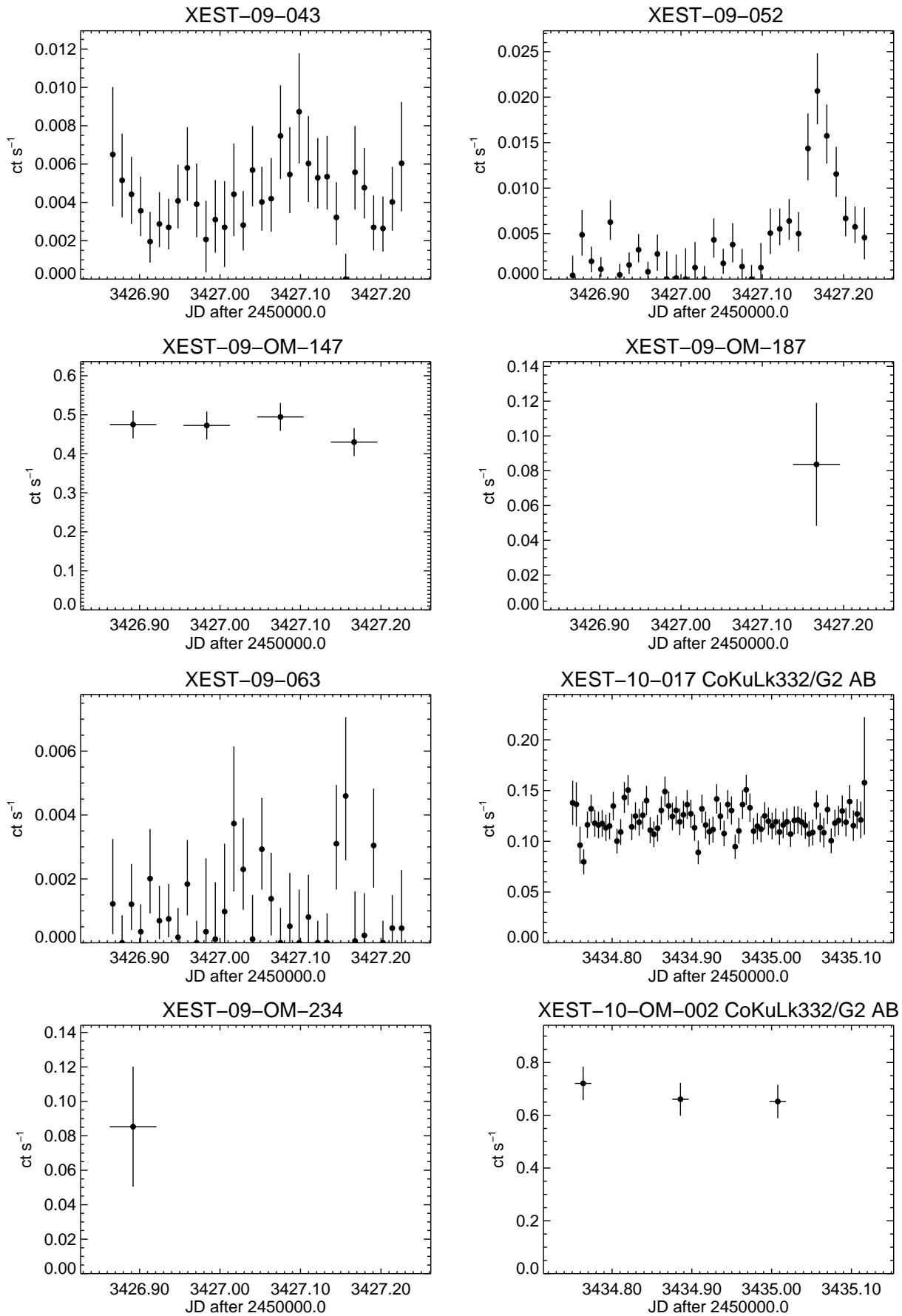


Fig. B.1. Light curves (continued).

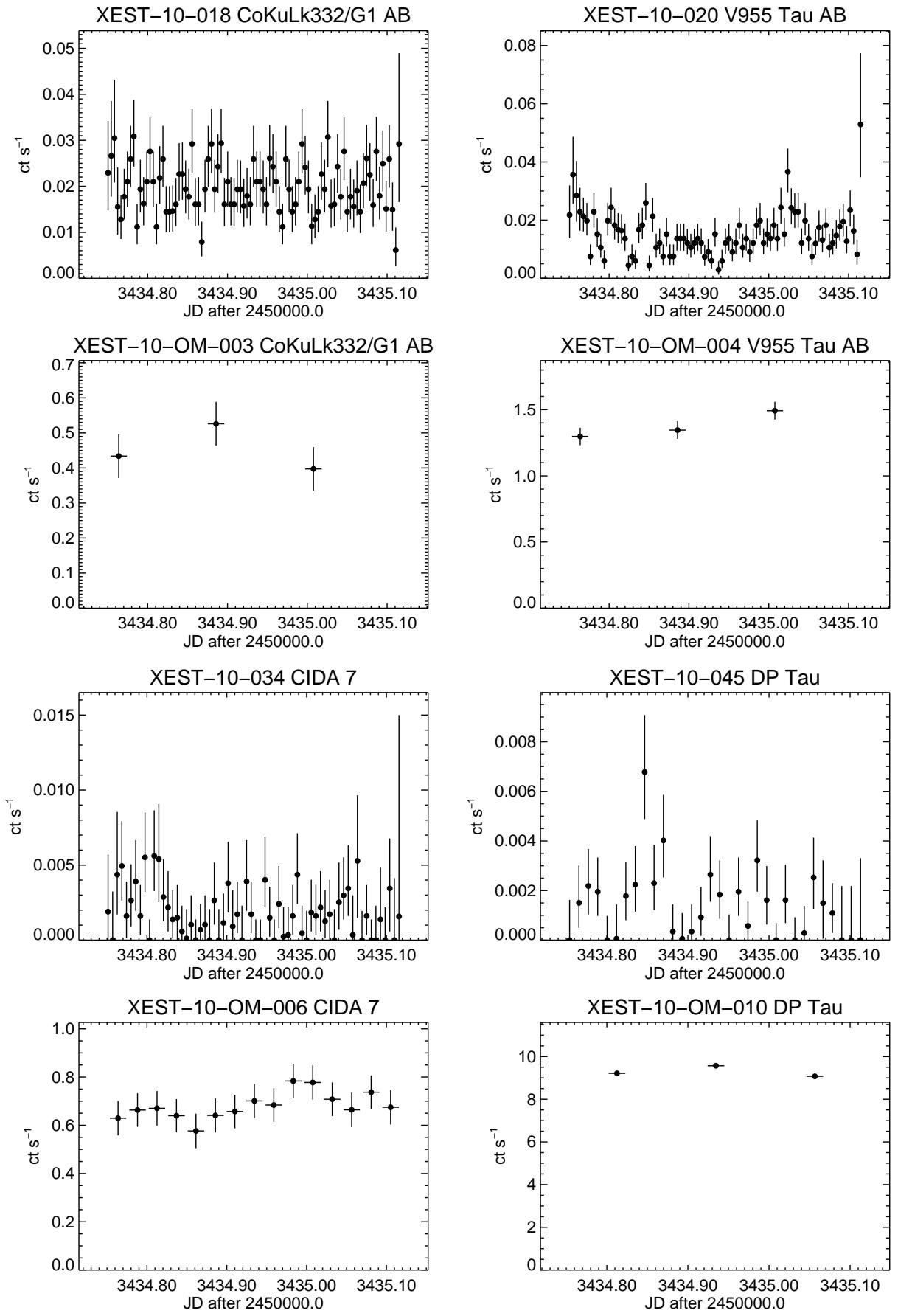
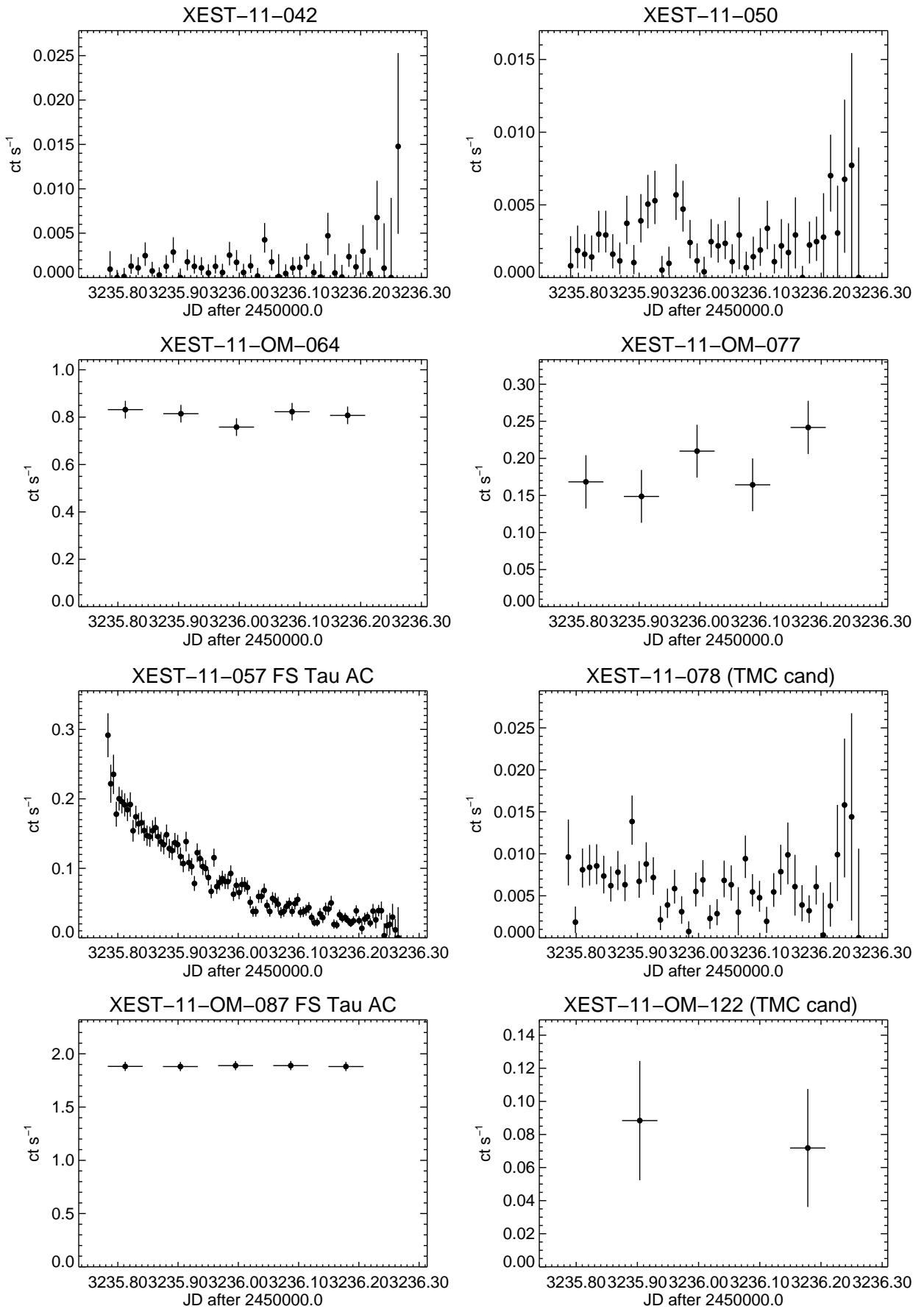
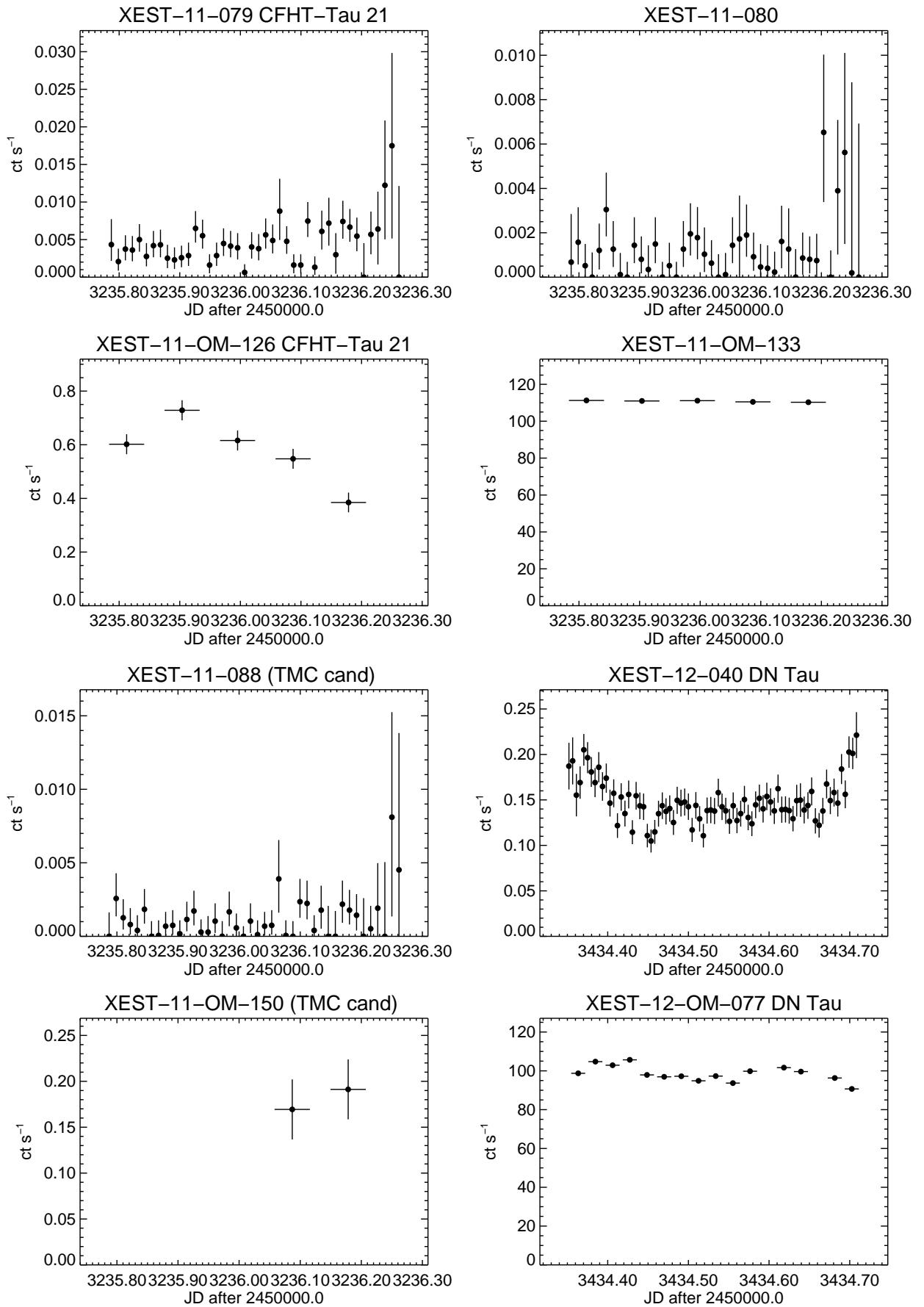


Fig. B.1. Light curves (continued).

**Fig. B.1.** Light curves (continued).

**Fig. B.1.** Light curves (continued).

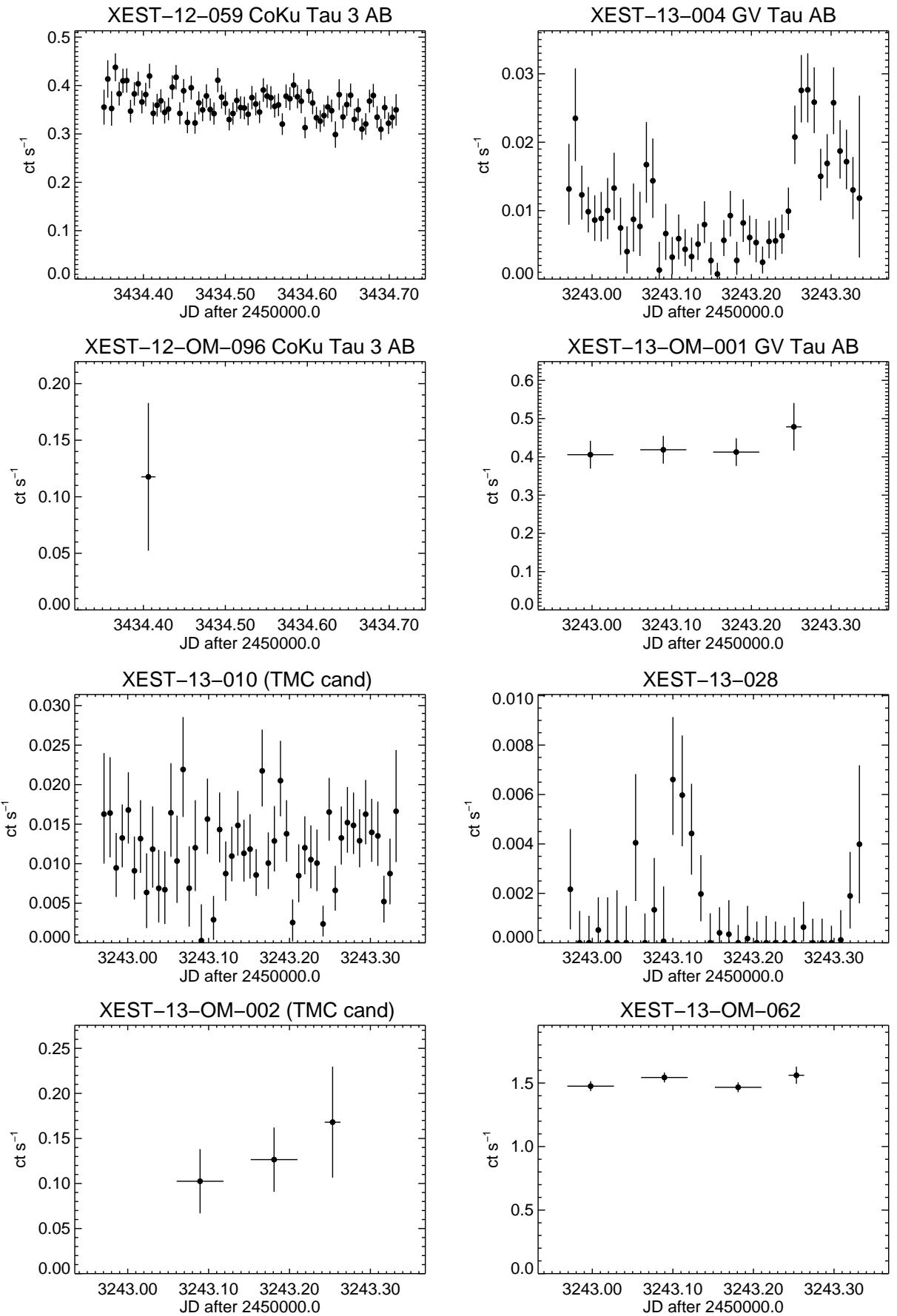


Fig. B.1. Light curves (continued).

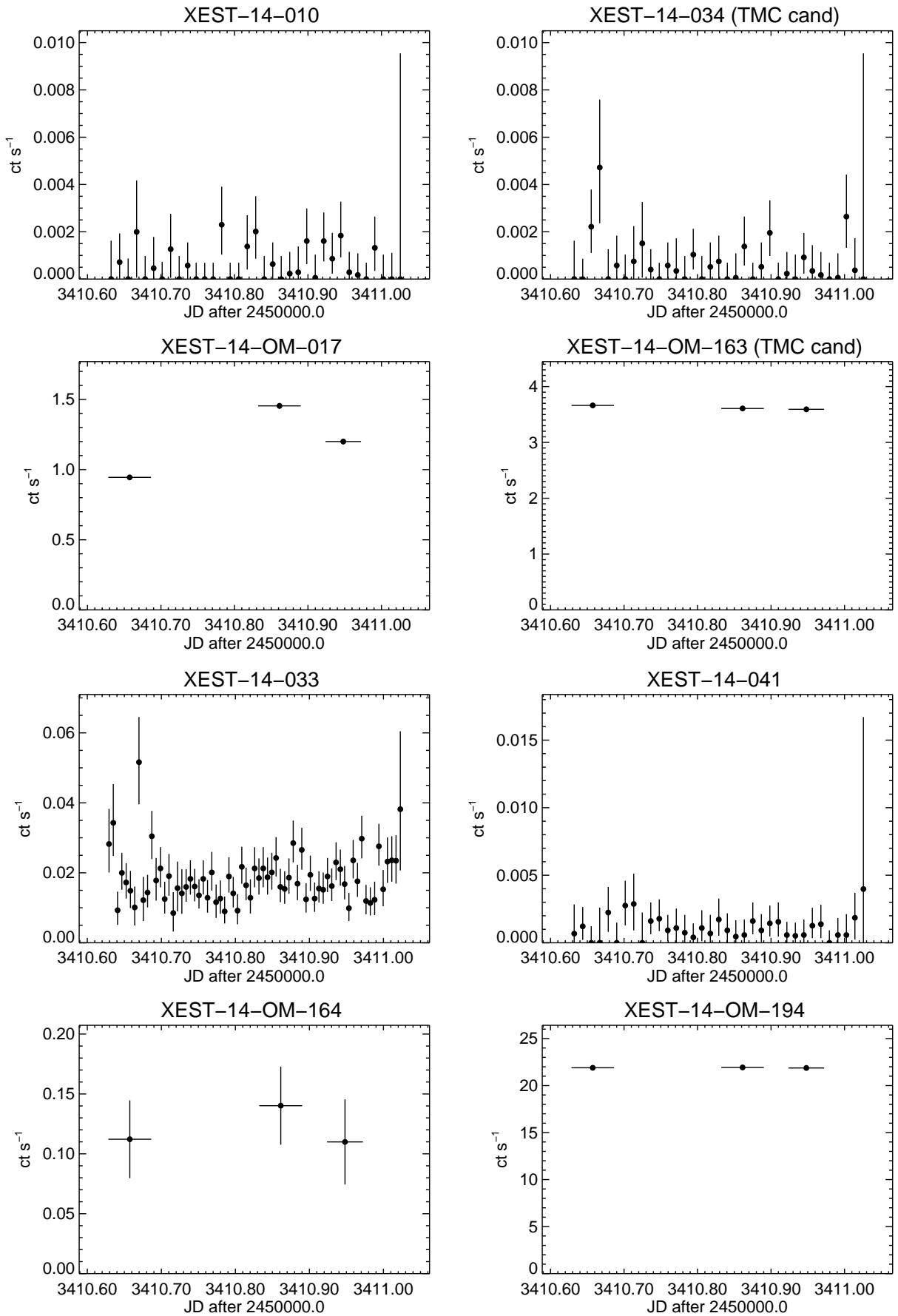


Fig. B.1. Light curves (continued).

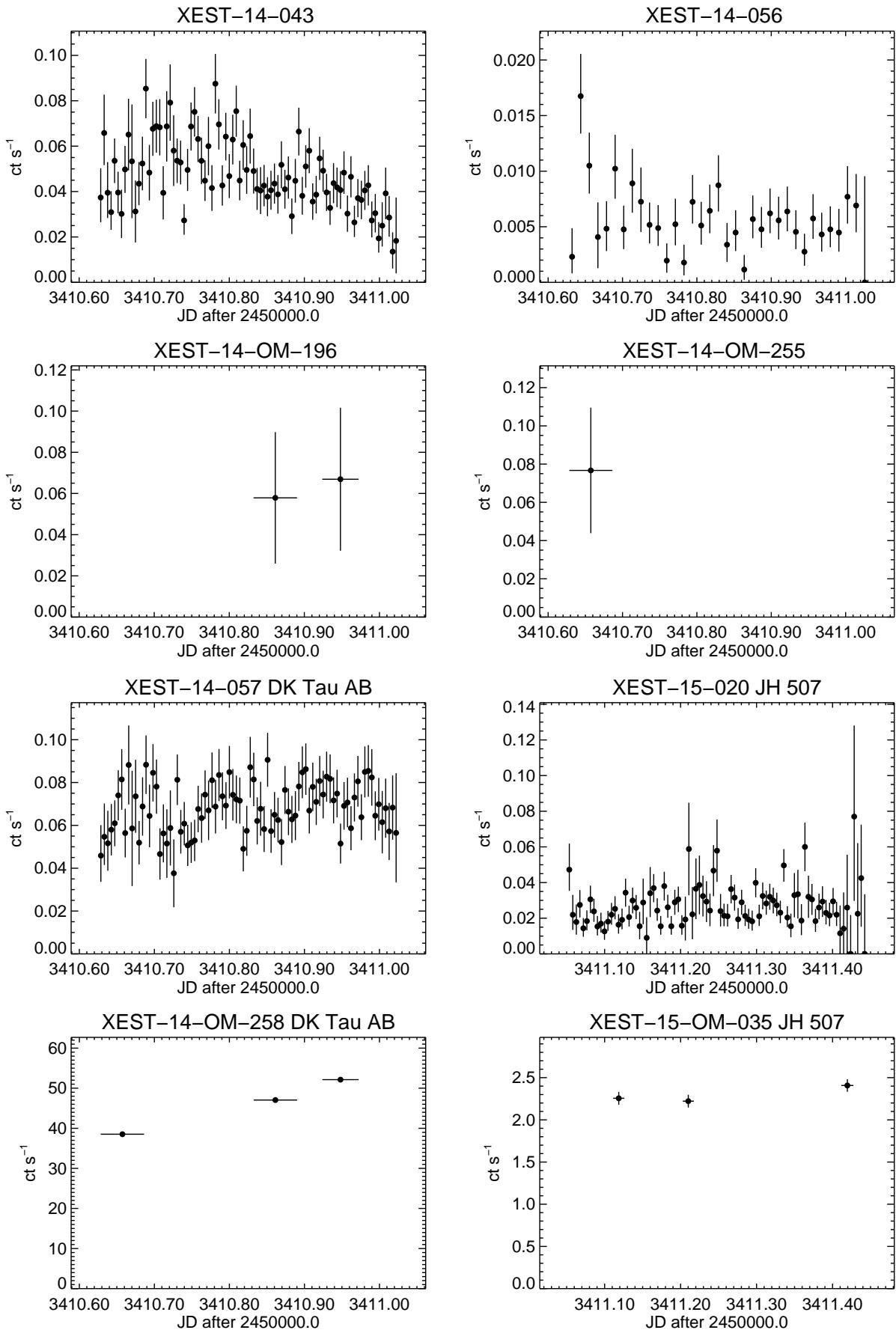
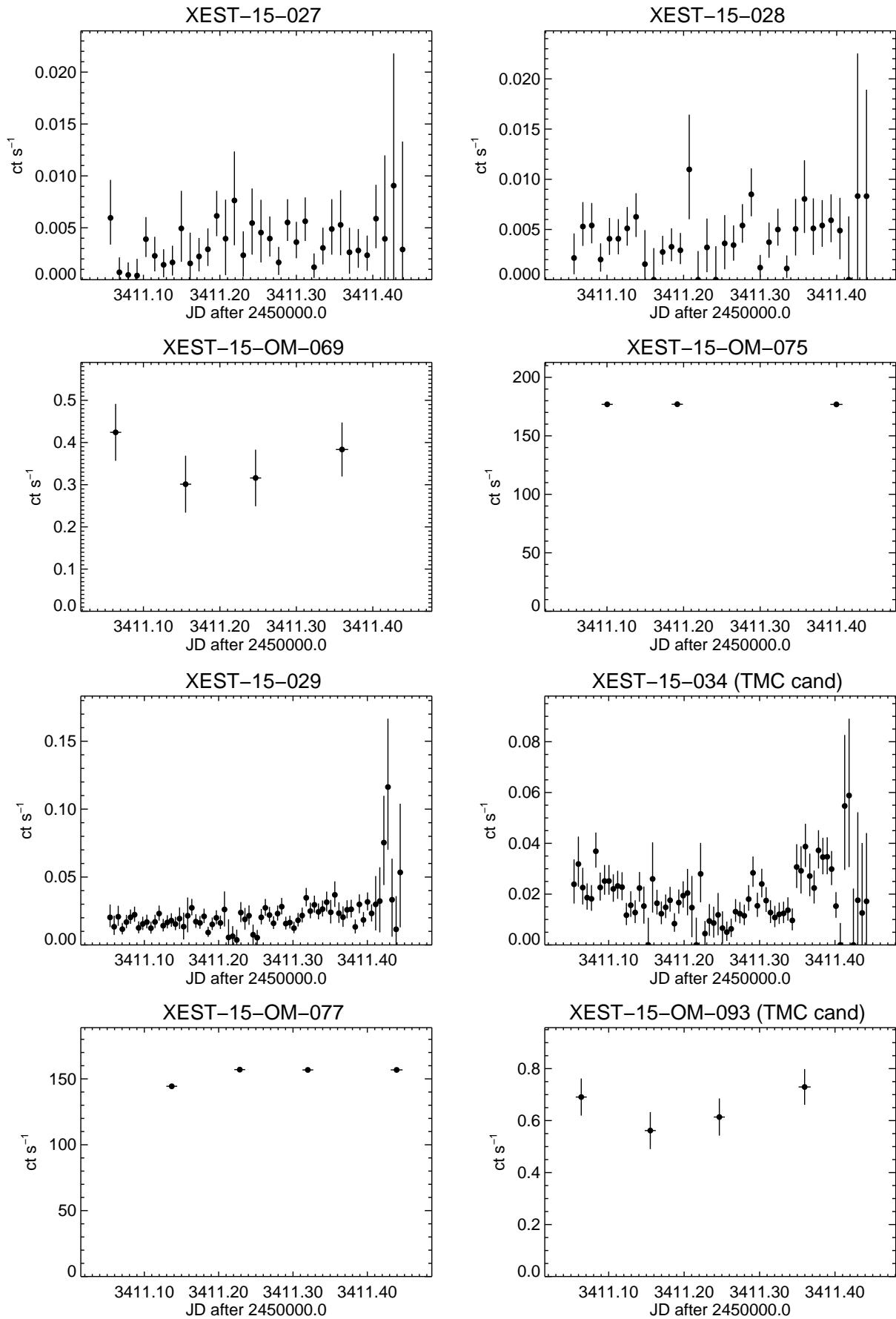


Fig. B.1. Light curves (continued).

**Fig. B.1.** Light curves (continued).

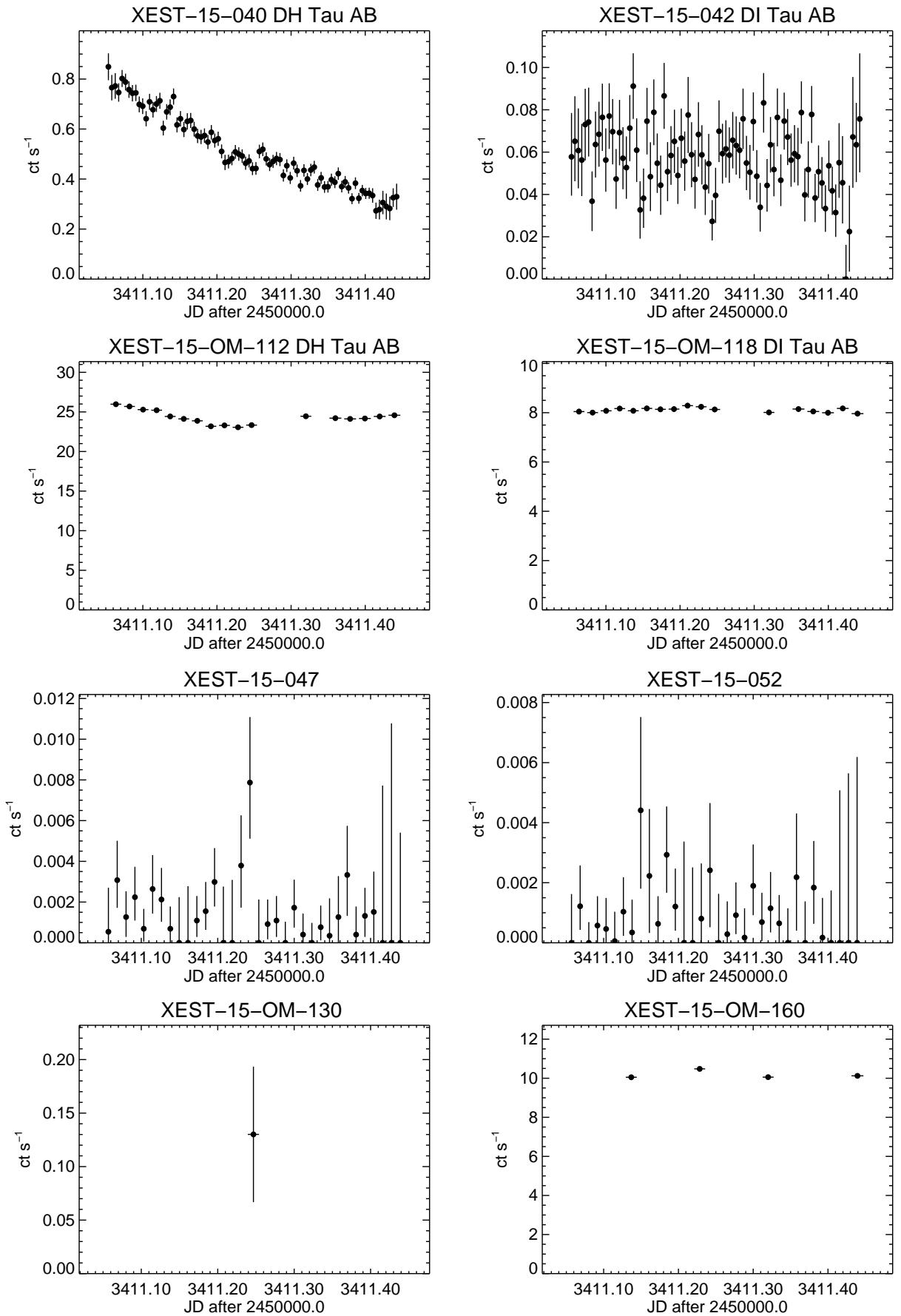


Fig. B.1. Light curves (continued).

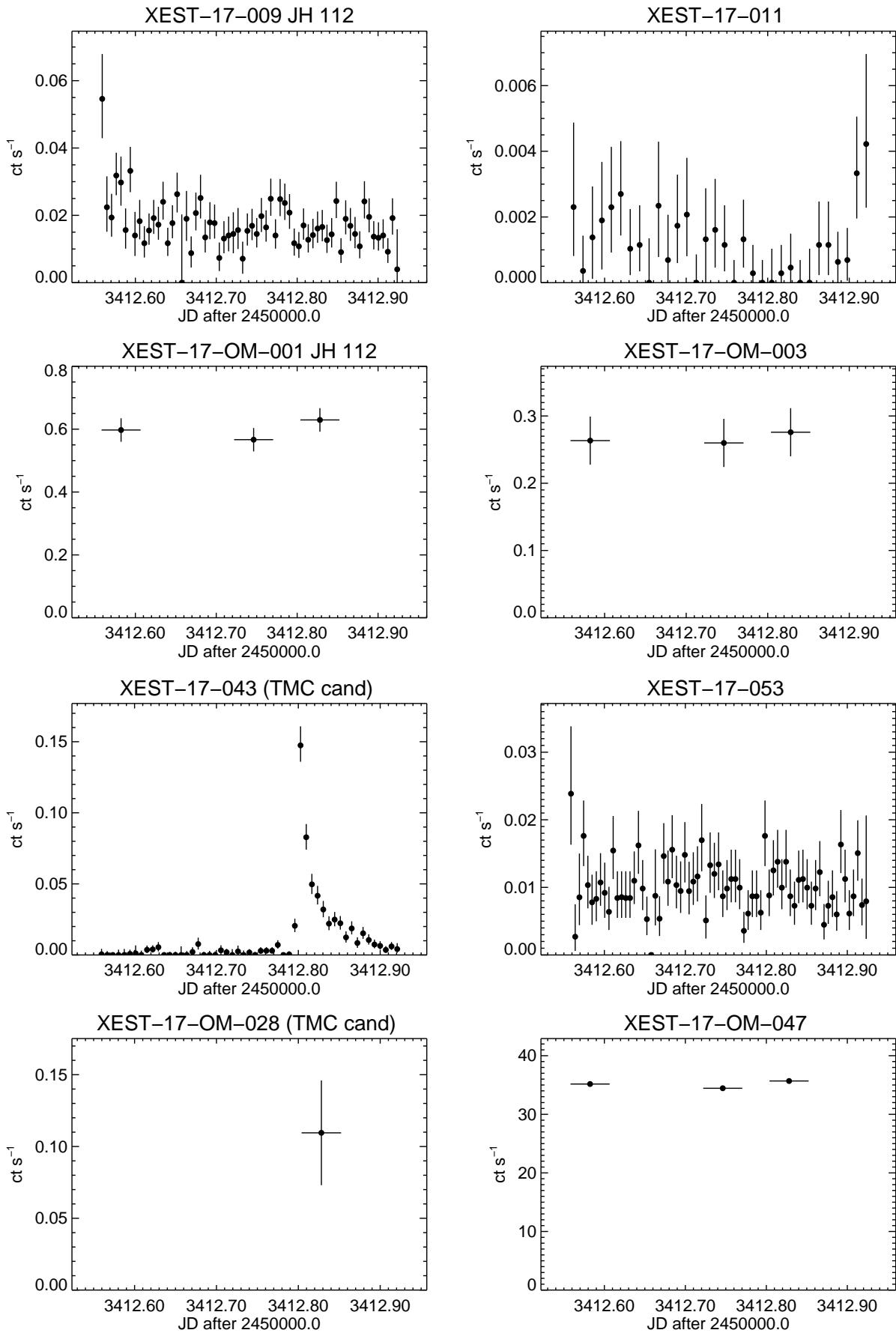


Fig. B.1. Light curves (continued).

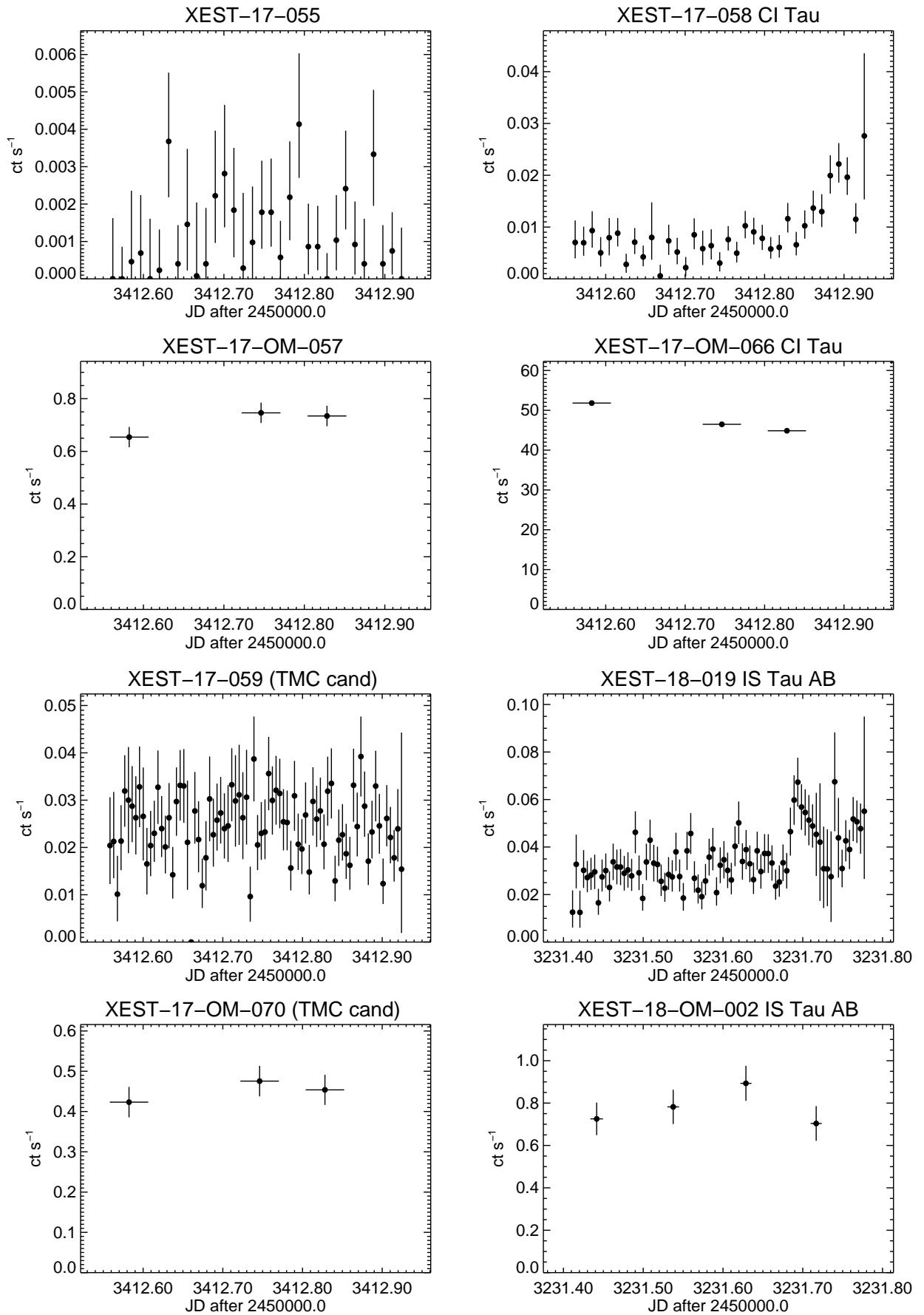


Fig. B.1. Light curves (continued).

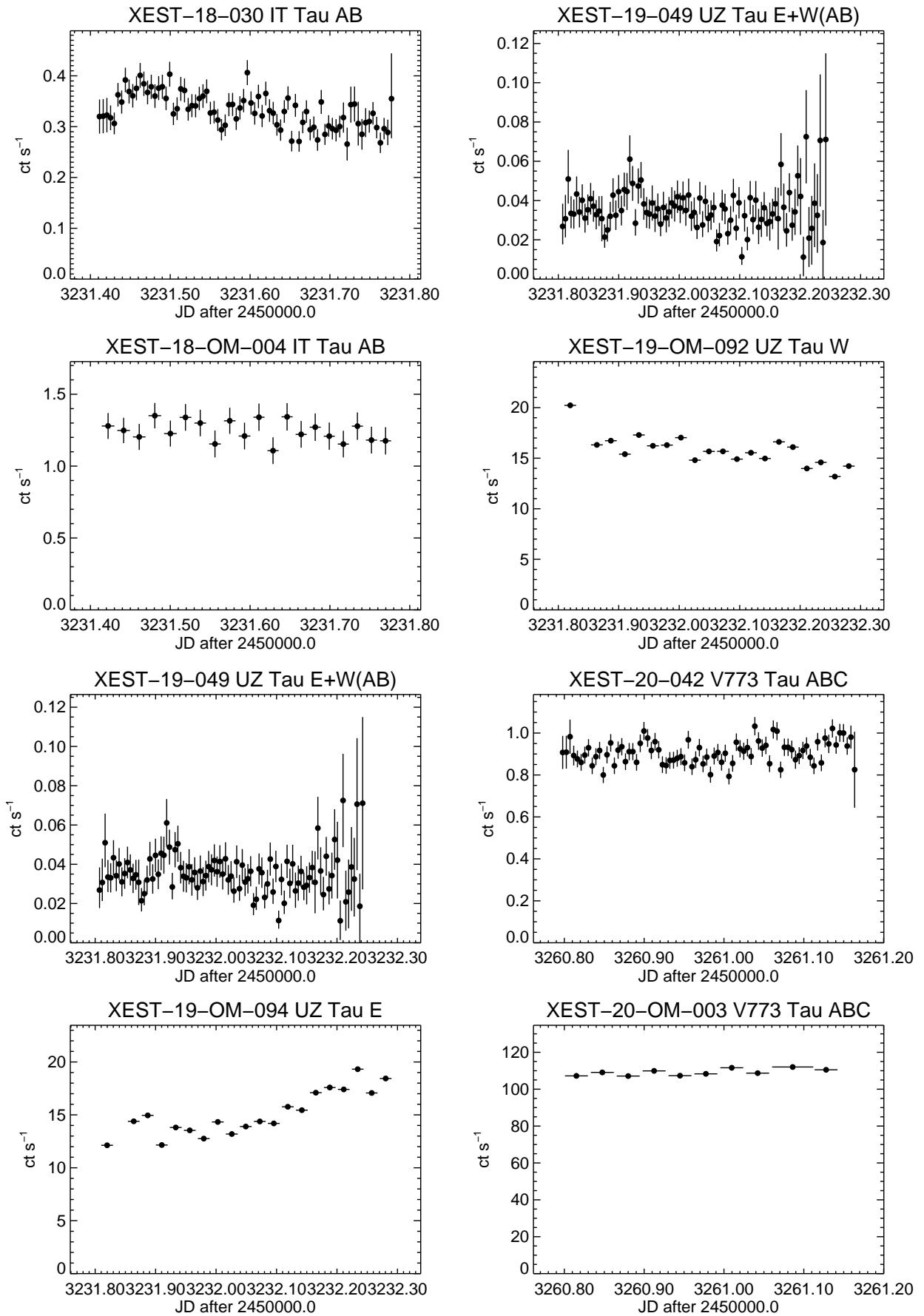


Fig. B.1. Light curves (continued).

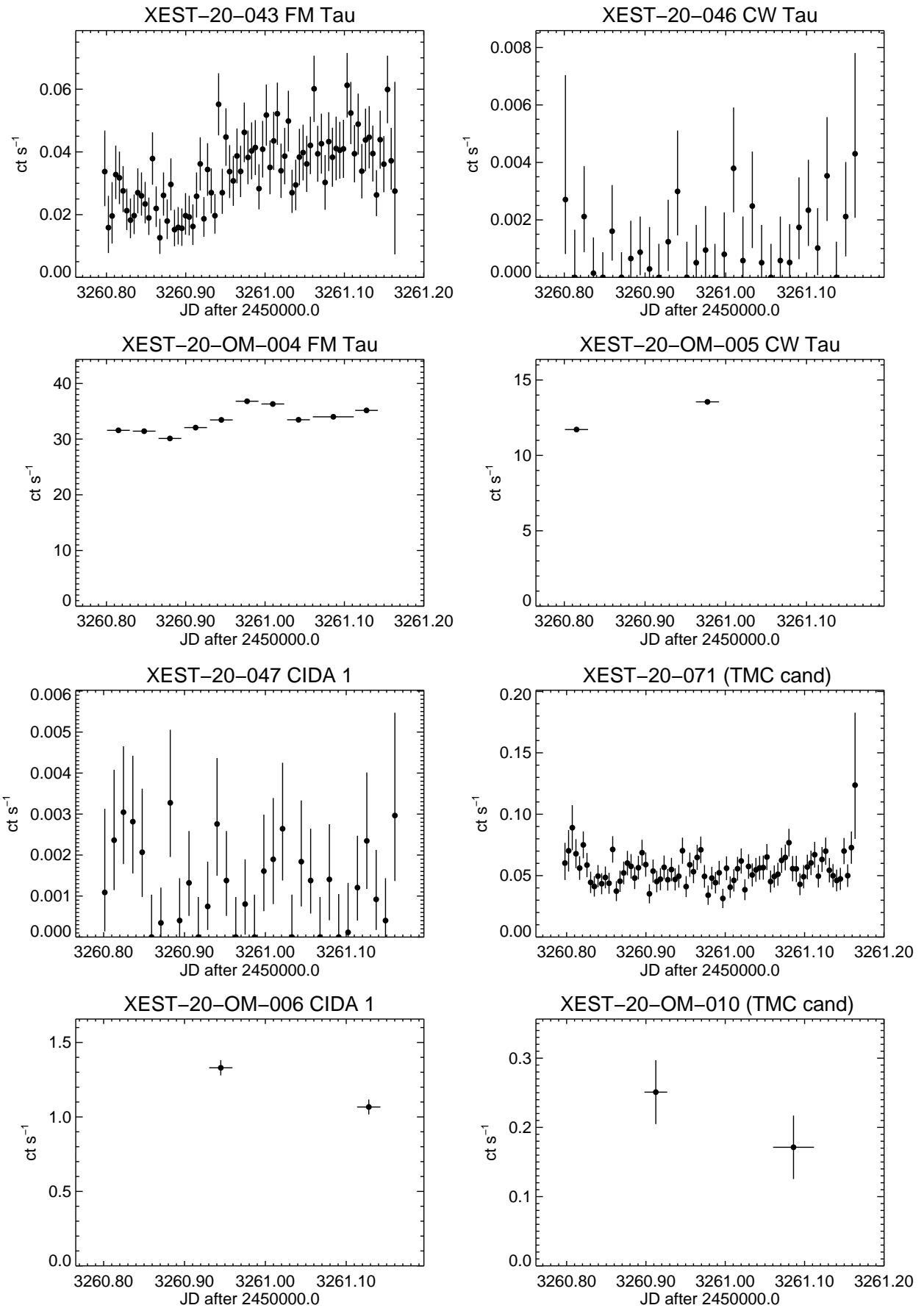


Fig. B.1. Light curves (continued).

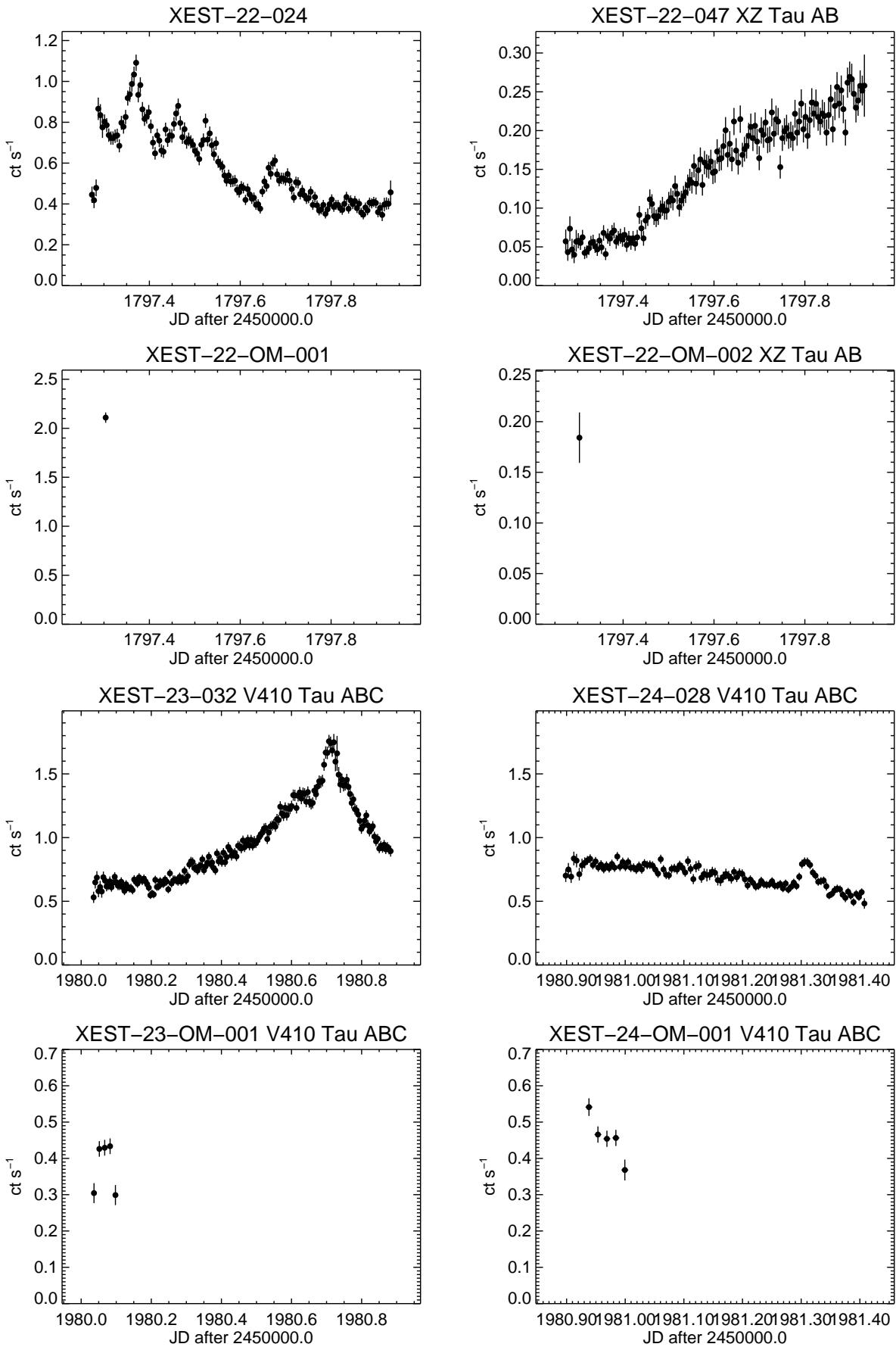


Fig. B.1. Light curves (continued).

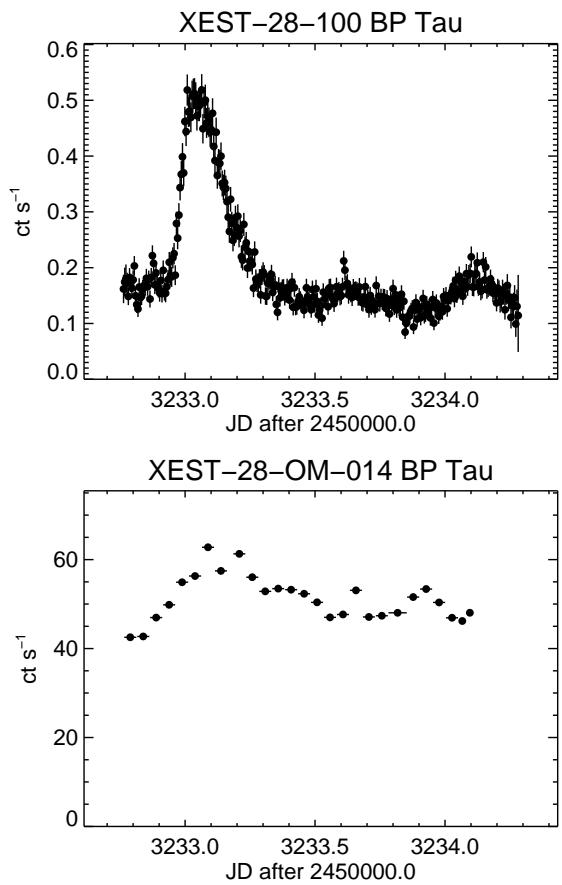


Fig. B.1. Light curves (continued).