First Meeting of ISSI Team

Decoding the Pre-Eruptive Magnetic Configuration of Coronal Mass Ejections

April 4-8, 2016

Guidelines & Agenda

Overarching Goals

What questions need to be answered?

- What processes form the magnetic configuration(s) (filament channels) that lead to CMEs/eruptive flares?
    - Flux emergence, flux cancellation, energy-helicity accumulation, … ?
- What magnetic configuration(s) result from these processes?
    - magnetic flux ropes (MFR), sheared magnetic arcades (SMA), others??
- What is required for these to destabilize and produce a CME/eruptive flare?
    - Reconnection, amount of twist, decay factor for overlying field, others?

Possible Top-Level Tasks for the Team

What do we want to achieve in 2 mtgs?

1. Determine the observational distinguishers between the different formation mechanisms.
    a. Is there some process(s) that is observed to be present in every filament channel formation?
    b. What do the models predict (quantitatively!)?
    c. What observations would rule out a particular process?
2. Determine the observational distinguishers between MFR and SMA
    a. What do the models predict as to the observable plasma and field?
    b. How much twist/shear is actually needed?
    c. Can present observations actually tell the difference between MFR and SMA – how?
3. Determine the observational signatures of the various destabilization mechanisms.
    a. Are there unique signatures of ideal vs. reconnection – driven eruption?
    b. What observations would rule out a particular mechanism?

Possible Approaches to Achieving our Tasks

1. Attack each question by combining theory (THR), modeling (MOD), and observations(OBS).
2. Clarify definitions of various ‘observational’ / ‘theoretical’ terms used in the literature.
3. One possibility is to split our team in 3 groups focused on each of the goals above. We could assign a lead for each to coordinate the actions of the group. This may help our productivity during the runup for mtg #2. To be discussed at the mtg.
4. Each team member should be prepared to contribute to one or more of the 3 Team Goals, and to discuss:
    a. What do we know and most importantly what is missing and what could be done (e.g., model resolution?, physics?, obs?. etc)?
5. Compile pre-eruptive structure (formation mechanism & identification) diagnostics matrix.
6. Select events for tasks 1 – 3.
7. Define model runs (old and possibly new) for tasks 1 – 3.

Rules of the Road

Given the large amount of research on the subject, the team should have a very complete idea of issues, problems, and ways forward. Therefore, we should focus on the Team Tasks through lively discussions and brainstorming (for most of the mtg, at least) to bring those to the surface rather than set talks. We hope that the following ‘rules of the road’ can achieve this:

1. Be prepared to present your ideas on the various issues/aspects with 1-3 slides (per task). But do have backups in case of additional questions.
2. Prepare a list of suggestions for the matrix.
3. Bring examples of events for tasks 1 – 3.
4. Bring examples of models for tasks 1 – 3.
5. Make sure you can access Google drive on your laptops prior to the mtg (please make sure to not edit the documents as anonymous so that we can keep track of the changes).

High-Level Daily Agenda

Day 1	Morning	Welcome (Saliba Saliba, Angelos Vourlidas, Spiros Patsourakos); Goals/Tasks/Agenda (Lead: Angelos Vourlidas,,All)
	Afternoon	Tasks 1-3 (Vasilis Archontis, Alexander Nindos, Jie Zhang, Georgios Chintzoglou)
Day 2	Morning	Tasks 1-3 (Lucie Green, Stephanie Yardley, Petros Syntelis, Tibor Torok)
	Afternoon	Tasks 1-3 (James Leake, Guillaume Aulanier,Bernhard Kliem, Vasyl Yurchyshyn, Xin Cheng)
Day 3	Morning	Welcome/Introduction to ISSI (Maurizio Falanga); Tasks 1-3 (Ron Moore, Spiro Antiochos, Manolis Georgoulis, Angelos Vourlidas, Spiros Patsourakos)
	Afternoon	All Tasks
Day 4	Morning	All Tasks
	Afternoon	Work assignments
Day 5	Morning	Work assignments, Decide mtg#2 time(cont)
	Afternoon	Open