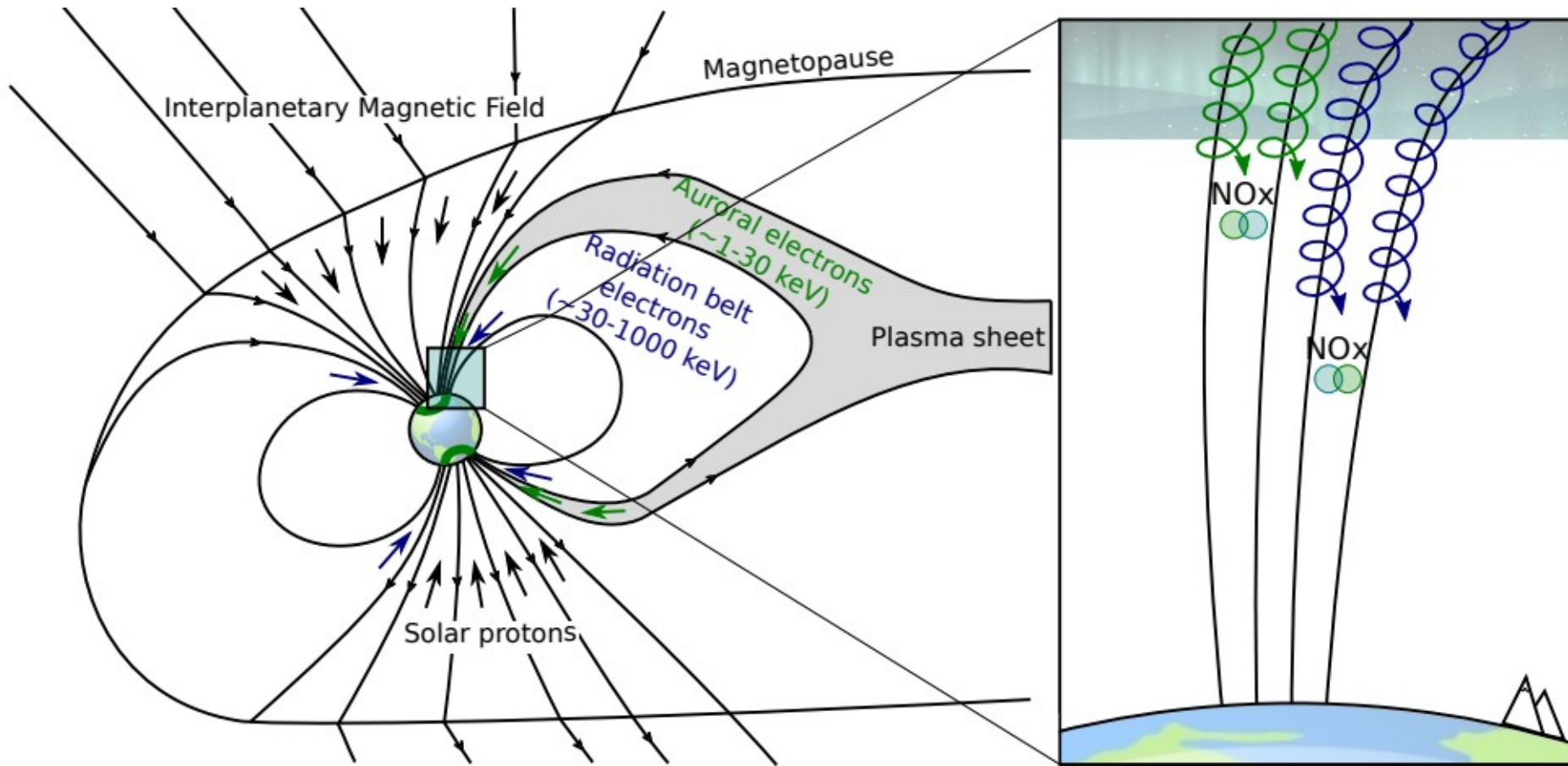


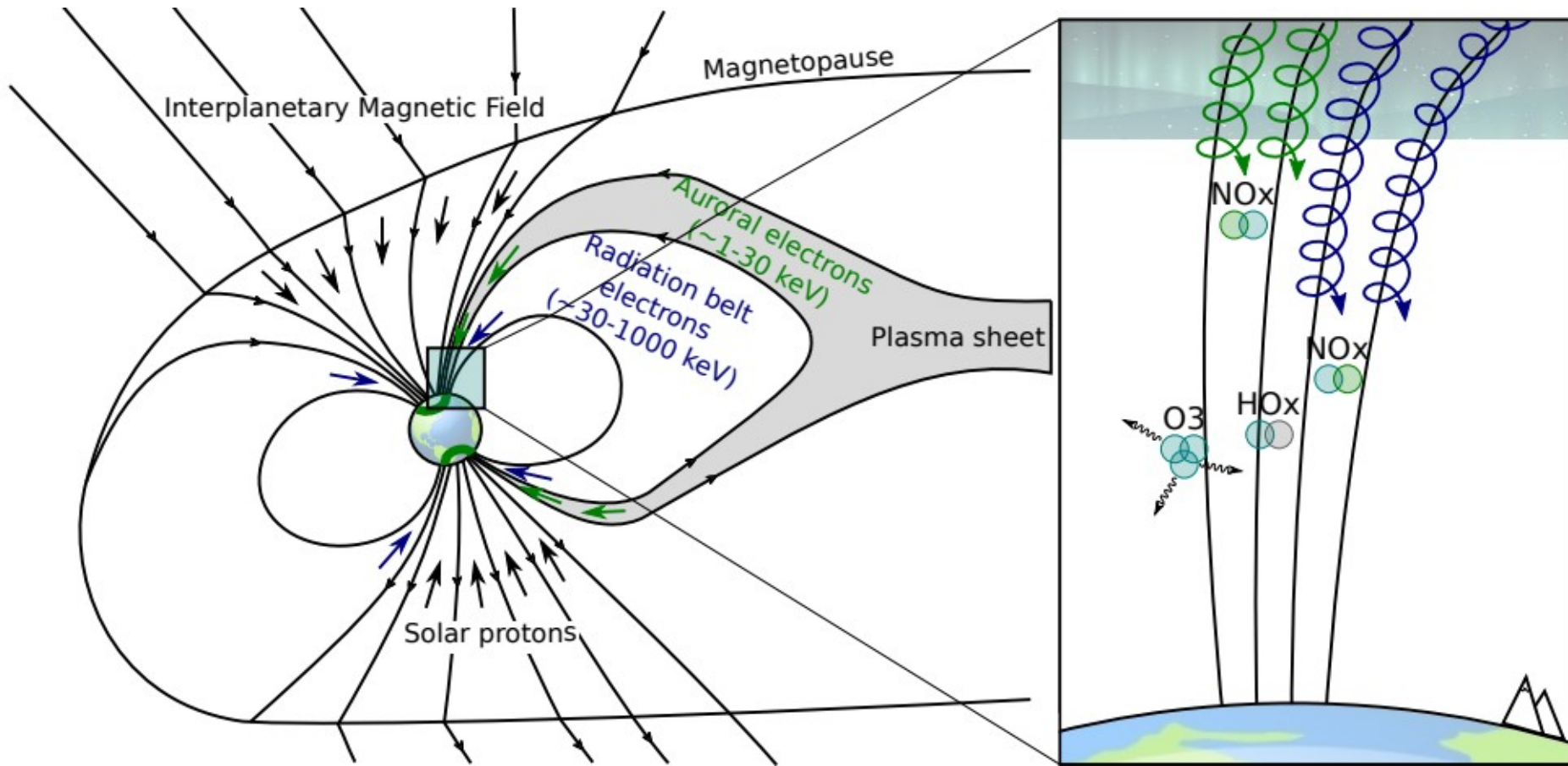
Atmospheric electron precipitation effects using POES, SOFIE, and WACCM

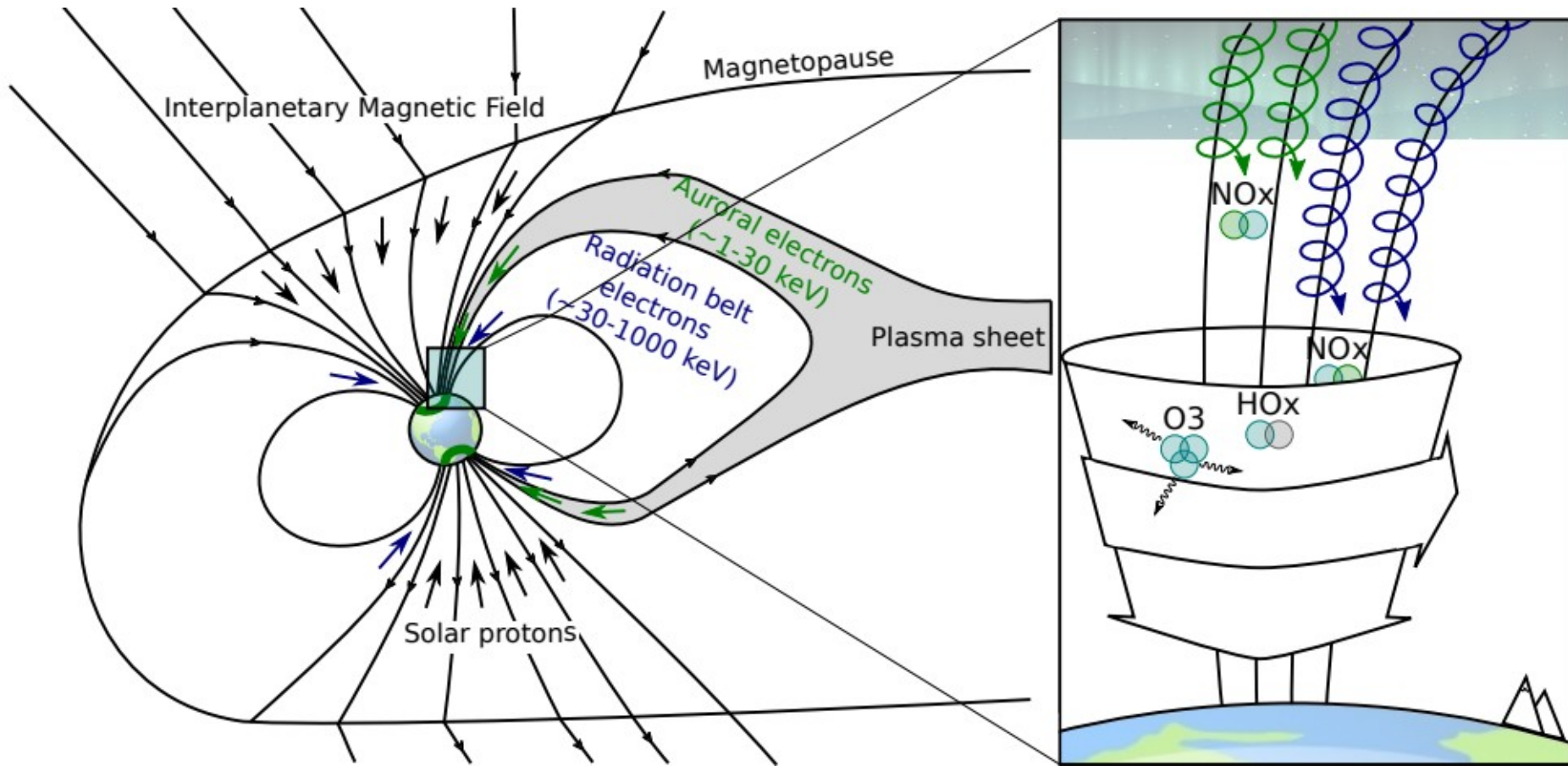
Christine Smith-Johnsen

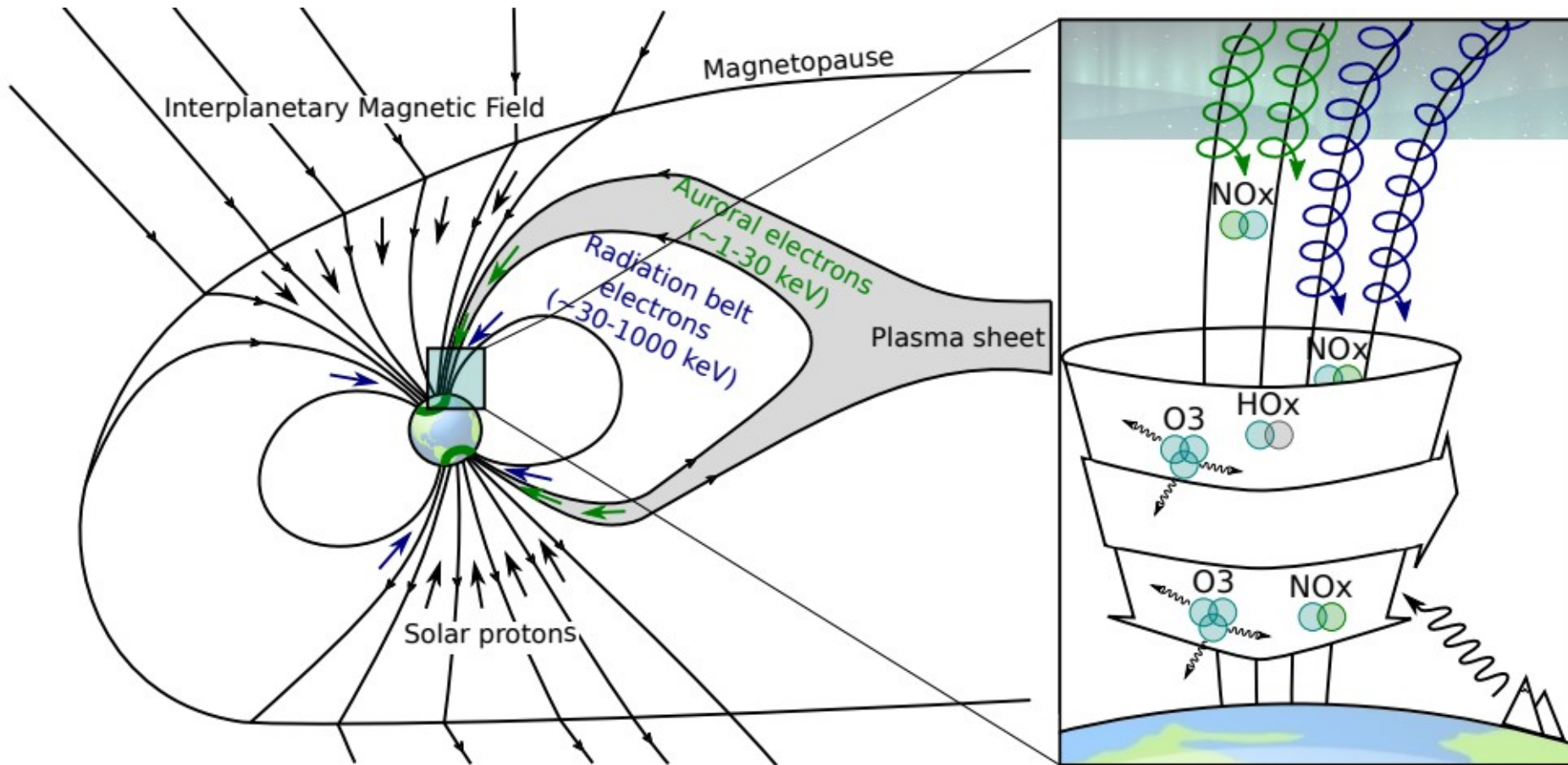
Mostly working with energetic ELECTRON precipitation and effects on thermosphere and mesosphere

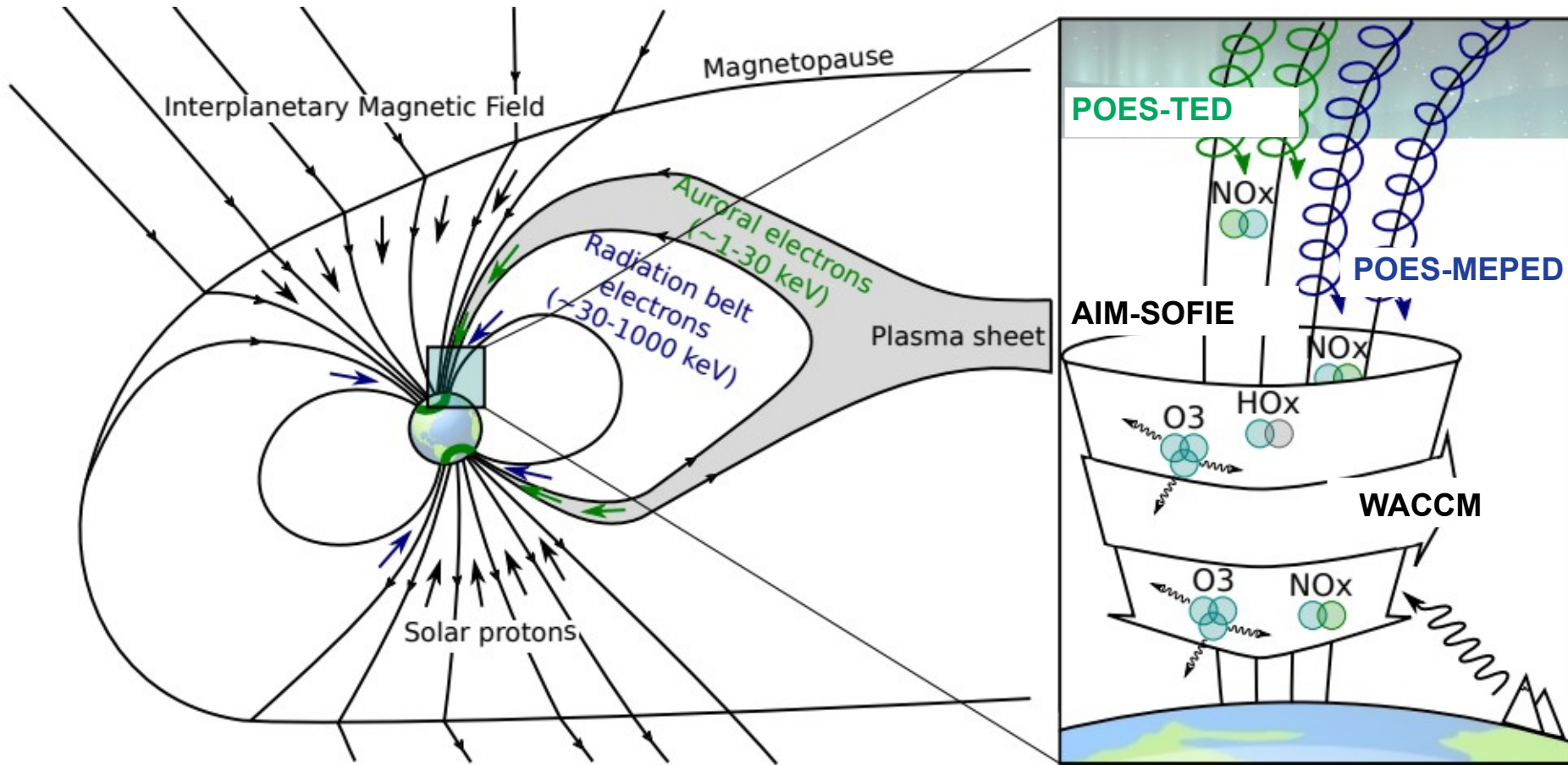
- Satellite observations of EEP from POES satellites
- NO and O₃ observations from SOFIE instrument on AIM satellite
- Atmospheric modeling with WACCM











TED and MEPED detectors - energy

TED

(Total Energy Detector)

Electron energy

0.15-0.22 keV

0.69-1.00 keV

2.12-3.08 keV

6.50-9.46 keV

MEPED

(Medium Energy Proton and Electron Detector)

Electron energy

> (30) 43*keV

> (100) 114* keV

> (300) 292*keV

> 756 keV *

* Ødegaard et al., (2017)

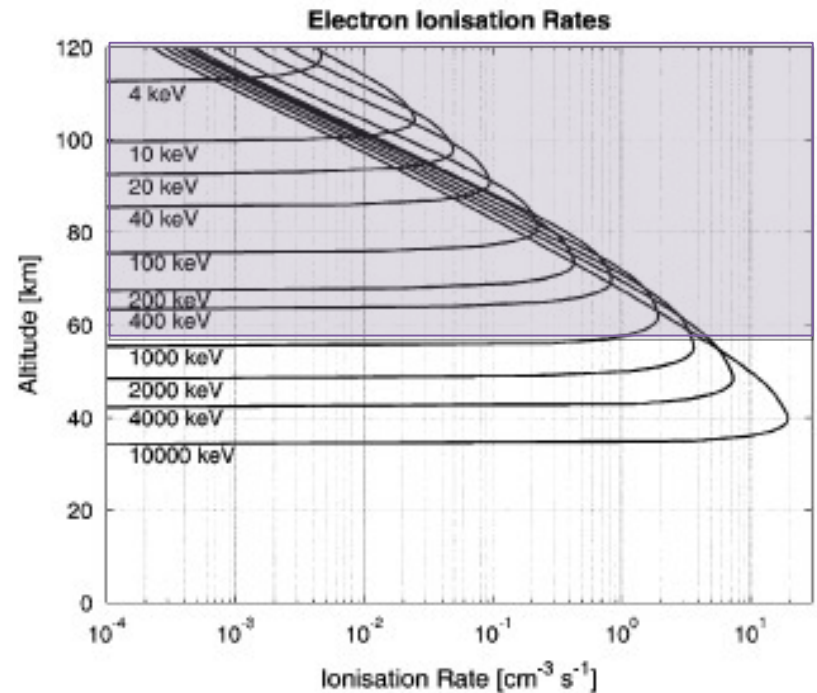
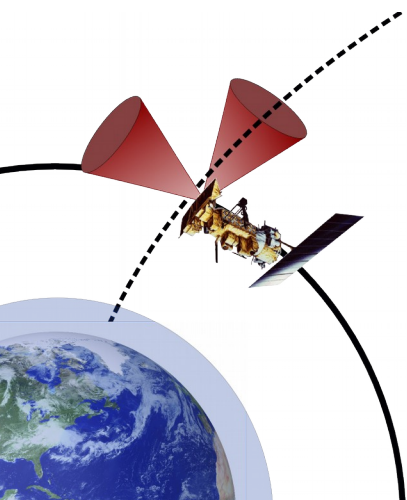
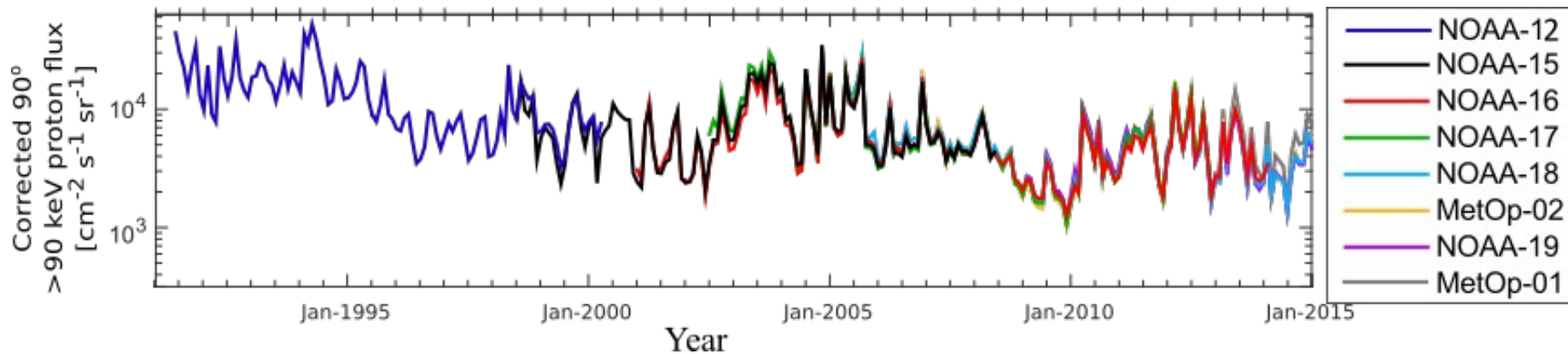


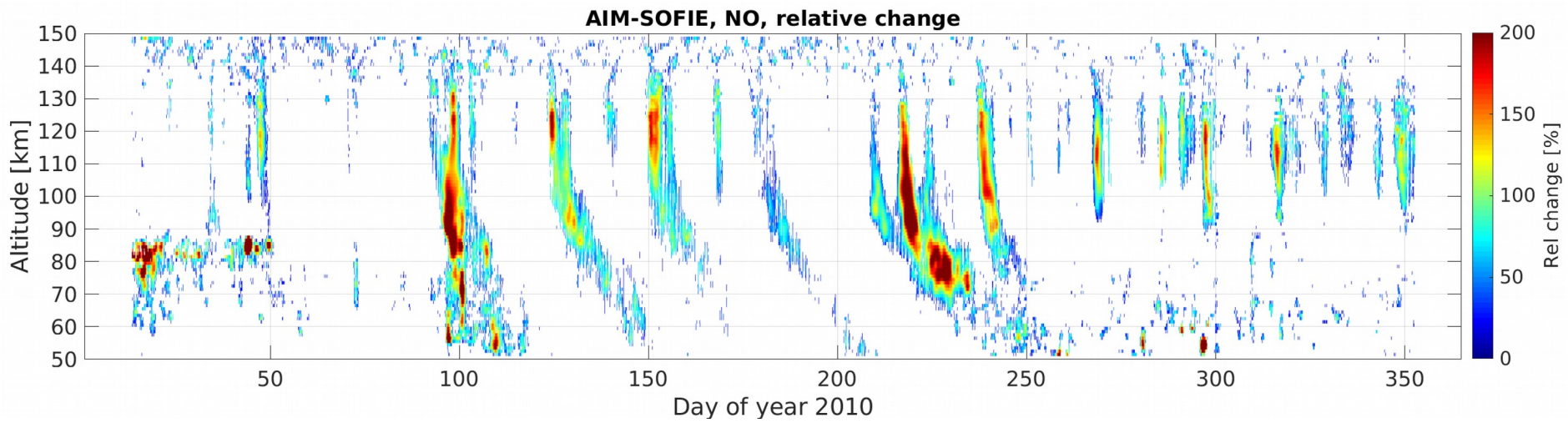
Figure reference: Turunen et al. (2009)

A continuous electron spectrum from ~1 to ~750 keV, depositing their energy throughout the entire Mesosphere Lower Thermosphere





Corrected for detector degradation,
proton contamination, with new energy
limits, one extra electron channel, and
loss cone fluxes based on 0 and 90



Auroral-Kp

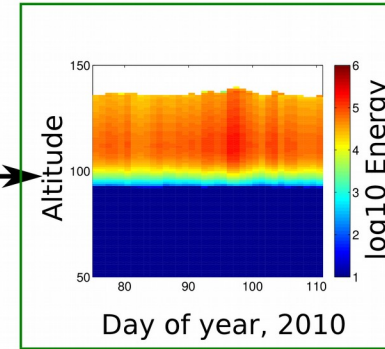
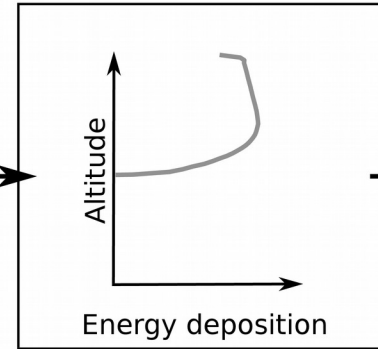
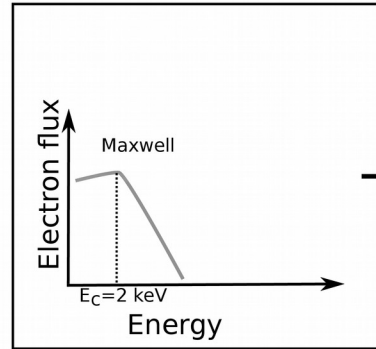
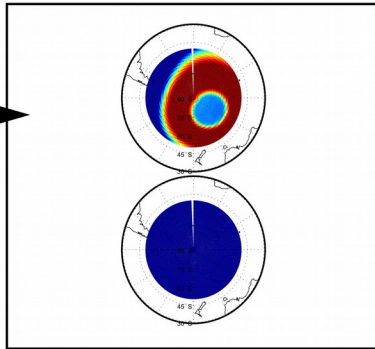
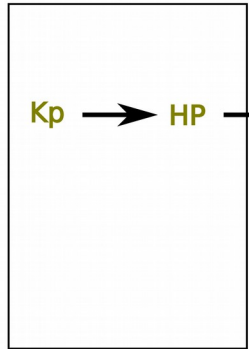
Observational
input

Geographical
distribution

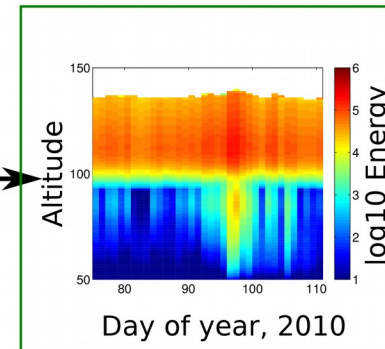
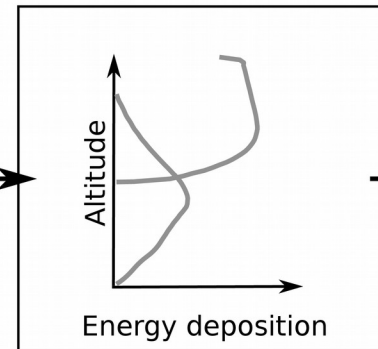
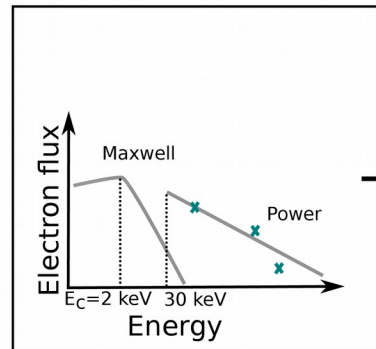
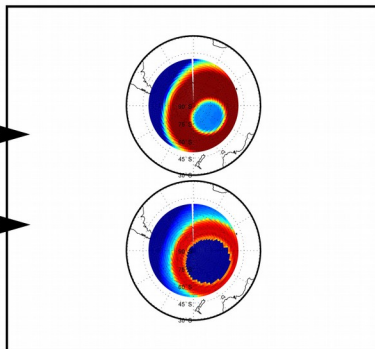
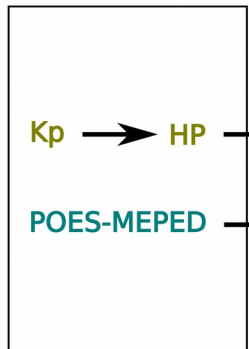
Energy distribution

Energy deposition

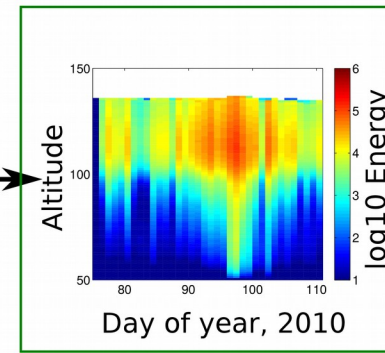
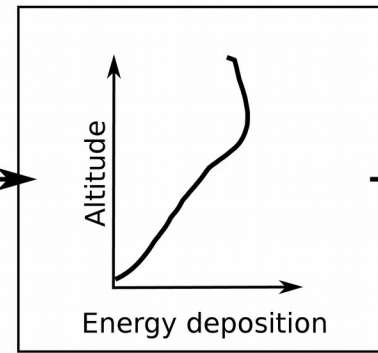
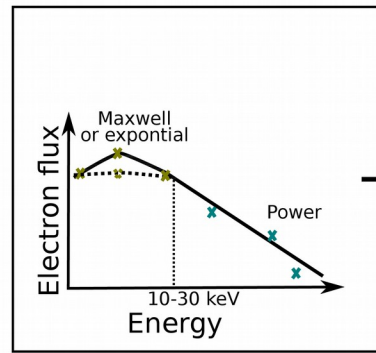
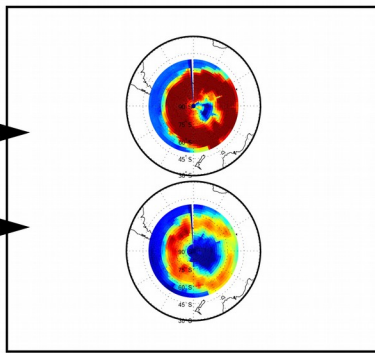
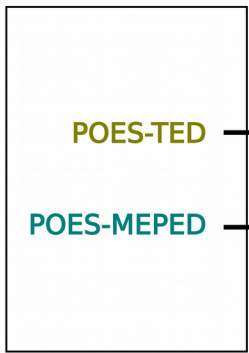
Ionization rates

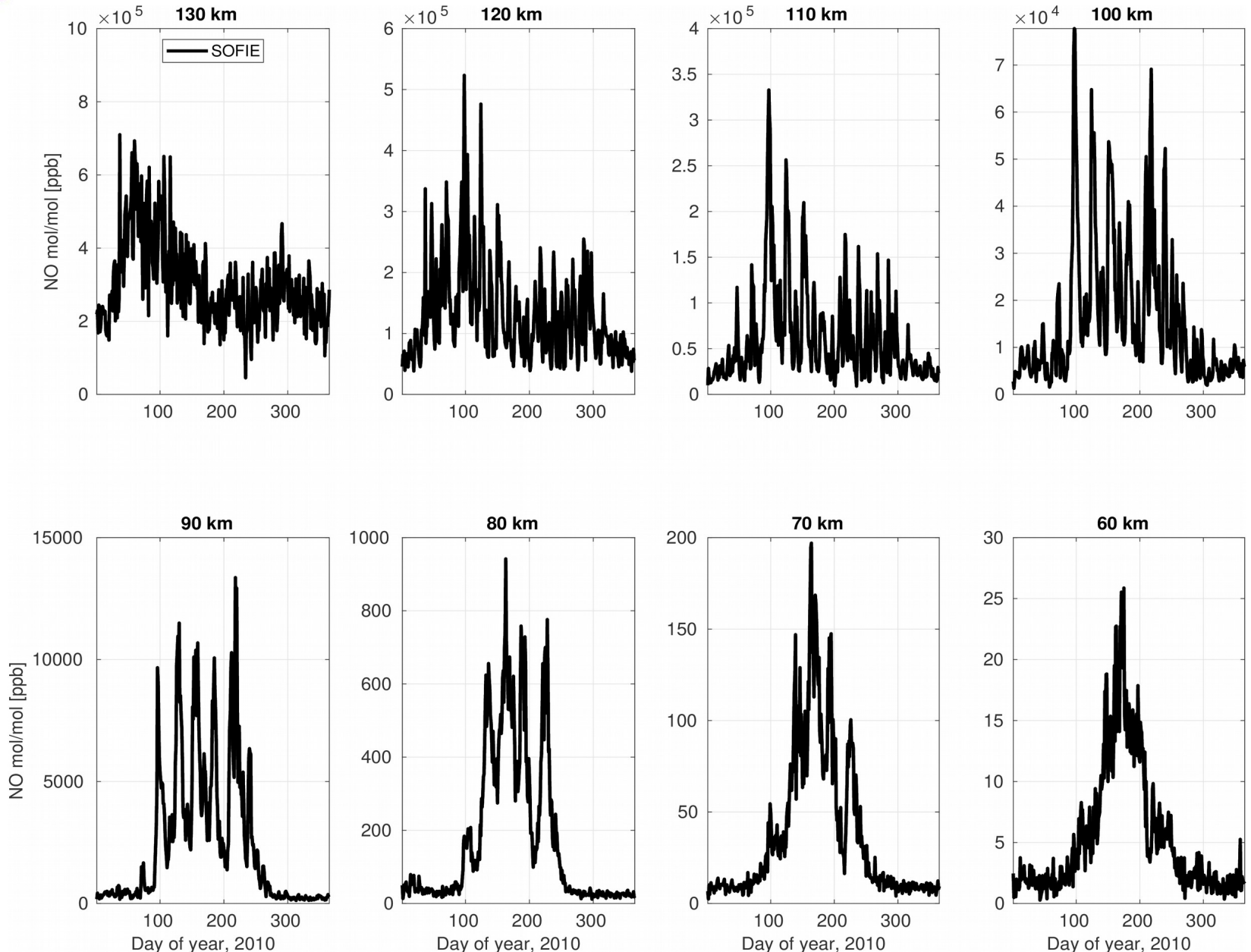


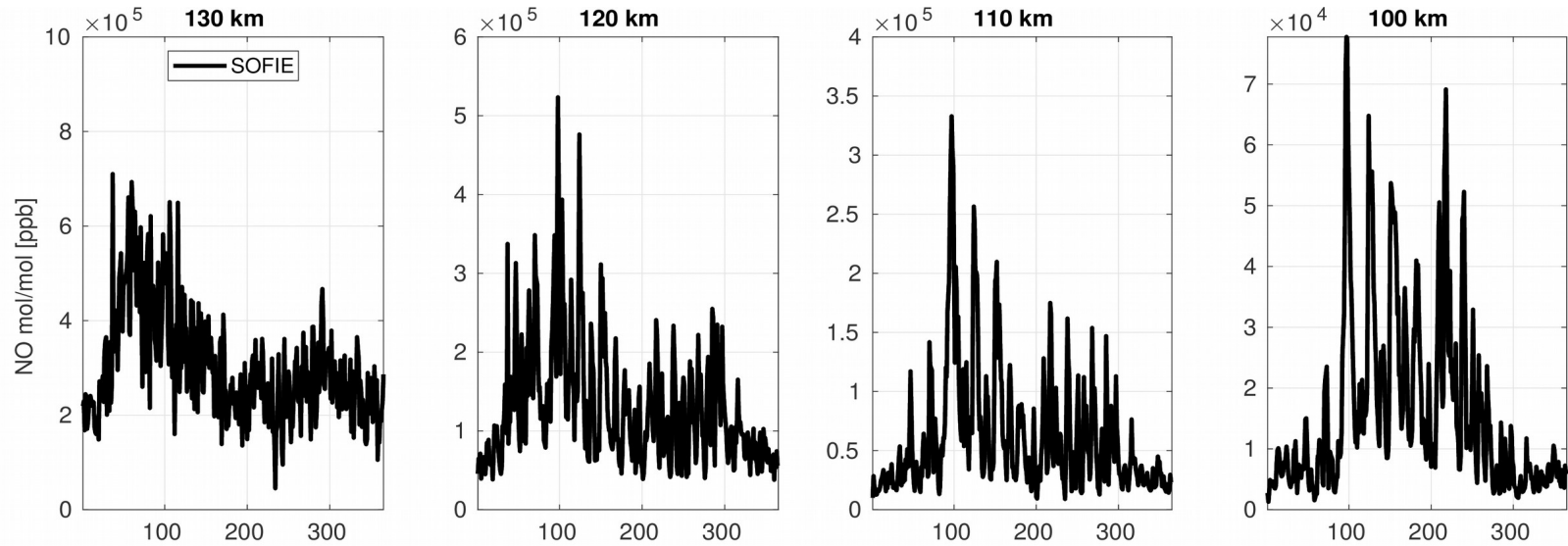
Auroral-Kp + MEE



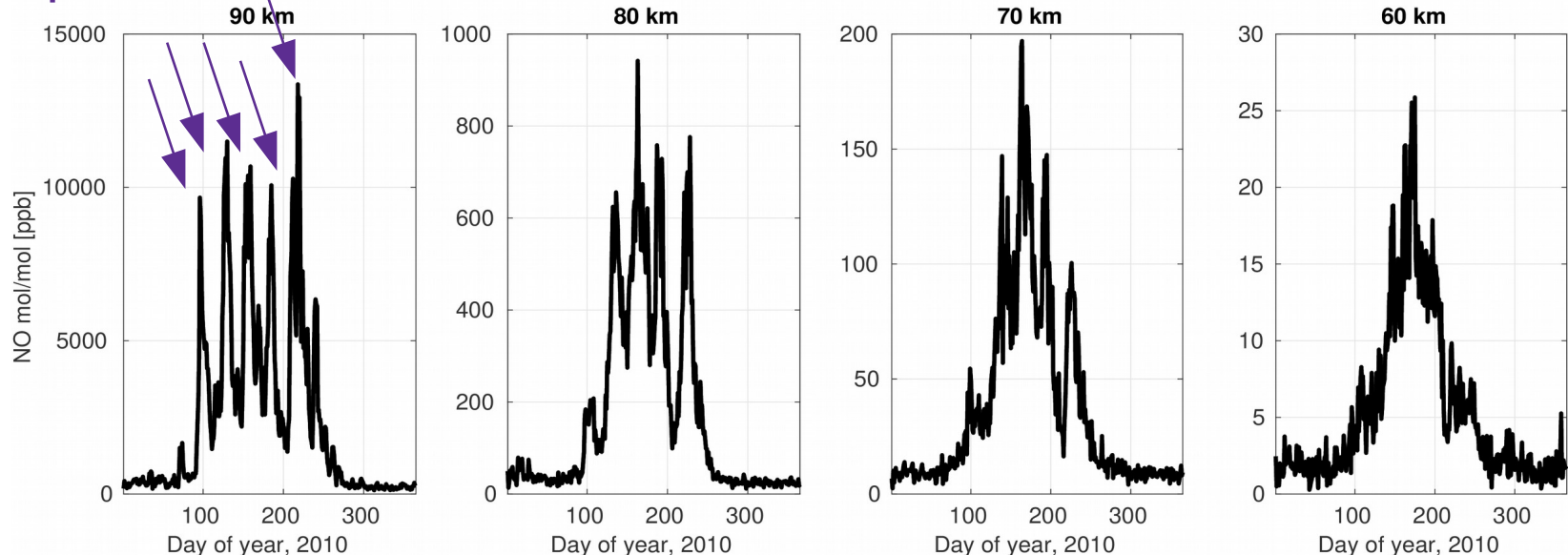
POES-FRES

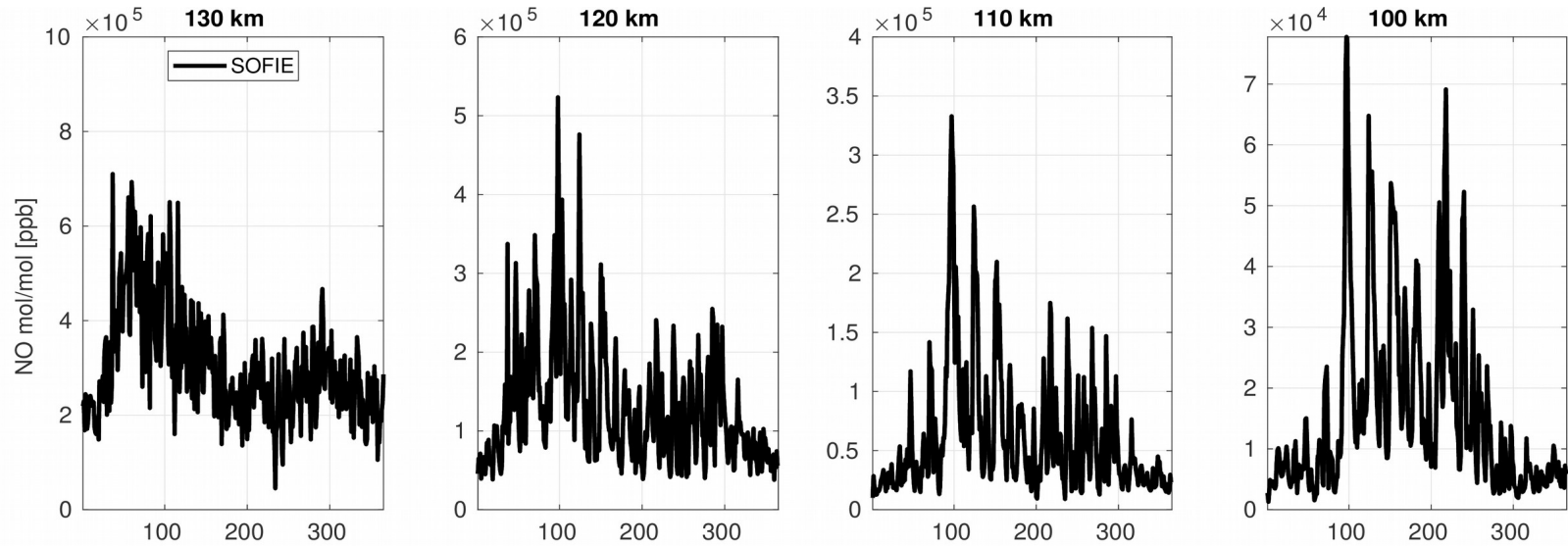






EPP production





EPP production

