

Request for a rerun of IHOP 268

Peter Young has had a DST proposal accepted for observations in the period 15–28 October and requests Hinode support through another run of IHOP 268, Transition Region and Coronal Response to Moving Magnetic Features (MMFs). This IHOP asks for 5–6 hours/day, but since it requires a fairly active AR and a sunspot, it is not likely that observations will be requested for full period. Due to the DST support, the observing period will have to be something like 12–18 UT (to be confirmed).

Below are the details of the IHOP

Summary

The moat region around sunspots shows numerous moving magnetic features (MMFs): small magnetic features that move radially outwards from the sunspot. MMFs can have an opposite polarity to the sunspot, and an early IRIS data-set from 2013 October 22 demonstrated that such MMFs can exhibit both transition region and coronal emission as they cancel against stronger plage fields. These MMFs all show signatures in the AIA 1700 channel and the IRIS Mg II and C II lines. A subset show very strong Si IV emission, and a smaller subset show coronal emission in the AIA 171 filter. The MMFs typically have a lifetime of 20–60 minutes, and they move over distances of up to 25 arcsec.

This IHOP will obtain coordinated observations between SOT, XRT, EIS and IRIS to identify the magnetic topology and evolution that determines what temperature these MMFs reach. Signatures of the (presumed) magnetic reconnection will be identified through dynamics seen in the IRIS and EIS emission lines.

Target

A well-defined sunspot is the preferred target. MMFs are most clearly seen in the AIA 1600 filter, so observers should check the most recent movie from, e.g., Helioviewer and identify one location in the moat region where MMFs are interacting with strong plage. This will be a good candidate for the MMF heating events. The pointing center should be chosen to be between the plage and the sunspot.

The width of the IRIS and EIS rasters are 35" and 40", respectively, so the pointing should be chosen carefully. The pointing should be chosen by whichever satellite needs to upload the pointing first. Please contact the PI (Peter Young) if necessary.

Duration

A duration of 5–6 hours is requested in order to maximize opportunities to identify events in a small spatial region.

Request to SOT (edited on 2015 Aug. 31)

The field of view should be 30–40" in X and 80–100" in Y.

FG: BFI Ca II filtergram with 2x2 binning. 30 second or better cadence.

SP: very fast maps, with cadence ~200 seconds. Programs 0x18e (30x82") and 0x18f (30x120") can be used, or modified to change the width (and cadence, in proportion)

Request to XRT

Use a low temperature filter (e.g., Ti-poly) and a hotter filter (e.g., Be-thin). (The coronal MMFs are expected to reach temperatures of at least 4 MK). Field of view should be 128x128 and the full spatial resolution should be used. Cadence should be 30 seconds or better in each filter.

Request to EIS

Repeat the study Cor_Hole_Jet_v1 (ID 512) to fill the available time slot. The study must be centered on the same location as IRIS.

Begin and end the sequence with a single run of PRY_slot_context_v3 (ID 353).

Request to IRIS

OBSID: 3820256698 – sparse synoptic raster (35x175, 36 steps) with 4 second exposure times. Medium linelist. x2 FUV spectral binning.

Si IV slitjaw images with occasional Mg II w slitjaw images. For example, 34 Si IV images and 2 Mg II w images per raster.

Exposure control should be used for the slitjaw images.