

IHOP_Submission

Title of Proposed Observation:

[SOOP: Major Flare Watch]

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SSC Point of Contact: General: Adam Kobelski, Jessie Duncan (NASA/MSFC) / Tetsuya Watanabe (NAOJ) / Bart De Pontieu (LMSAL), XRT -- Katharine Reeves/Paola Testa (SAO)

Main Objective:

High cadence multi-wavelength, multi-viewing angle observations of flares

Scientific Justification:

Solar Orbiter's upcoming flare campaign will provide high cadence, unsaturated observations of high energy flare processes in the corona (X-ray spectroscopic imaging & EUV imaging), chromosphere ((E)UV spectroscopy) and photosphere (optical light imaging and polarimetry). Coordination with Hinode and IRIS provides an opportunity to study these processes in similar energy bands from substantially different viewing angles and at all layers of the solar atmosphere.

Dates: There will be 6 instances of the Major Flare Watch SOOP, on the following dates and times: #1:

2025-09-13 18:30 -- 22:30 UT

#2: 2025-09-17 06:50 -- 10:50 UT

#3: 2025-09-18 06:55 -- 10:55 UT

#4: 2025-10-02 20:30 -- 2025-10-03 02:00 UT

#5: 2025-10-03 20:30 -- 2025-10-04 02:00 UT

#6: 2025-10-06 18:00 -- 2025-10-07 01:00 UT

Time window: See times of instances of major flare watch above. We would like to request continuous co-observations from Hinode for these time ranges, if possible.

Target(s) of interest: The same targets as for Solar Orbiter are required. This will be selected according to the active region thought most likely to flare. The EIS slit should be positioned across the PIL.

SOT requests:

If the target is a flaring AR that is on disk, then optional context scans of the region are requested.

EIS requests:

We request that EIS run the Mg study "Rapid_Cadence_EIS_Flare_Stare" (acronym: FLAREDOP_EIS,

study ID: 472, raster ID: 449) be run during instances #1, #3, and #5 of the Major Flare Watch SOOP. This was run in previous major flare campaigns (HOP 0456 + 0489 + 500).

We request that EIS run the existing flare study "FlareResponse_SitnStare" (acronym: FlareResponse04_sns, study ID: 651, raster ID: 623) during instances #2, #4, and #6 of the Major Flare Watch SOOP. This sit-and-stare observation mode includes several hot-lines clustered around $\log T = 6-7$ taken at a 5s exposure. This will allow for high cadence composition and DEM analysis of the flaring region. Ideally, we would like EIS study coverage for the entire duration of this SOOP. This was run in a previous major flare campaign (HOP 500).

We would like to request that a slot raster (PRY_slot_context_v3 (ID 353)) is taken at the beginning and at the end of each instance of the Major Flare Watch SOOP, in order to provide important context information.

XRT requests:

We would like to request that XRT Be-thick is run in a fixed exposure mode, if possible. This is ideal for analysing flare time series on a high cadence. Based on discussions and recommendation from Lucas Guliano and Paola Testa, we would like to request this at a ~6 s exposure time, in order to optimise cadence but retain sufficient signal. From our perspective, the exposure can also be shorter than 6s (e.g. 2s) if that is preferable in order to ensure the safety of the CCDs, in the case of saturation. The major flare watch is targeting large flares so we think that there will be sufficient signal in the events of interest for such a short exposure time (of 2s).

If the proposed fixed exposure mode is deemed too risky for the safety of the instrument and/or the telemetry is limited we would like to request XRT is run in the same way as for HOP 476/489 with AEC 3.

IRIS requests:

IRIS coordinated observations have been requested.

Additional instrument coordination:

SOOP: R_BOTH_HRES_HCAD_Major_flare: Please see <https://issues.cosmos.esa.int/solarorbiterwiki/display/SOSP/Solar+Orbiter+Planning+-+for+coordination+with+external+parties> for additional coordination details.

For instances #2 and #3 of the Major Flare Watch SOOP, SST coordination has been requested.
For instances #4, #5, and #6 of the Major Flare Watch SOOP, DKIST coordination has been requested.

Previous HOPs:

I was not the PI of previous HOPs but this HOP is building on the previous major flare ones incl. 500, 489, 476 and 456.

Additional remarks:

Laura Hayes is the primary contact for these coordinated observations. Andrew Inglis is submitting the request on her behalf.