

L_SMALL_HRES_HCAD_Slow-Wind-Connection

Proposed SOOP Coordinators

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Description

Try to catch with Remote Sensing instruments the dynamics at an open-closed field boundary which will then be crossed in situ. High resolution RS observations required to catch dynamics. This SOOP will in general need **specific target pointing or target tracking** unless the SC is far enough from the Sun to catch.

Default SOOP duration: 3 days

Pointing requirements: Off-pointing: specific target pointing or target tracking

Triggers: only IS triggers enabled TBC

See SOOP 2 defined for [SOWG8 planning exercise](#).

Instrument	Mode	Comment
EPD	close mode + scheduled/triggered burst	
MAG	normal + scheduled/triggered burst	
RPW	normal + scheduled/triggered burst	selective downlink useful
SWA	normal + scheduled/triggered burst	
SPICE	combination SPICE Dynamics & SPICE Composition Mapping rasters	Raster area should be optimized to make sure open-closed field boundary is captured Line choices optimized for type of target <i>Use observation called SPICE_WIND_CONNECT in modelling. (See SPICE Pseudo-observations for SOOPs)</i>
EUI	EUV & LYA Coronal hole modes (C) (uses HRI) at 1min cadence FSI Synoptic mode (S) throughout	If TM is limited, varying priority schema can be used to keep HRI data manageable
PHI	Regularly spaced HRT data at medium to high resolution e.g. PHI_magnetograph_HRT_2 (600s cadence default) + regular PHI Full-disk Precursors	PHI LL magnetograms needed throughout. Note that 1 hour cadence can suffice for interchange reconnection at high resolution. Processing after the RSW: PHI could focus downlink on the most interesting periods, as inferred from other LL data
Metis	MAGTOP or GLOBAL (see METIS standard modes) for context and linkage of solar wind source regions to SC <i>modelled as GLOBAL with default settings</i>	Only applicable if beyond ~0.5AU during target tracking
SoloHI	Context via SoloHI synoptic modes	<i>Model for now as HI_SYN_NEAR</i>
STIX	STX_NORMAL	<i>not strictly needed for SOOP although context is appreciated</i>

SAP objective	Target	Duration	Opportunity/Orbital configuration	Operational constraints	Additional comments
1.1.2.2 Does slow and intermediate solar wind originate from coronal loops outside of coronal holes?	coronal loops outside of coronal holes	few days	<ul style="list-style-type: none"> near perihelion for resolution & better linkage conditions different phases of solar cycle radial alignment with SPP is a plus 	<ul style="list-style-type: none"> it may be worthwhile to map around the whole AR to have higher chance of being connected EMC quiet for connectivity 	radial alignment with SPP is a plus

1.2.2.6 Study fast plasma flows from the edges of solar active regions discovered with Hinode/EIS	edges of solar active regions - at most likely ballistic connection point	few hours	<ul style="list-style-type: none"> radial alignment with SPP is a plus 	<ul style="list-style-type: none"> fast flows require high cadence observations (mainly SPICE and HRI?) 	radial alignment with SPP is a plus
1.1.4.1.1 Interchange reconnection between open and closed field lines and its role in slow wind generation	<p>Open-Closed field line boundaries (near ballistic connection point):</p> <ul style="list-style-type: none"> CH boundaries AR edges close to low-latitude open field Intermediate areas of quiet Sun <p>Target tracking</p>	~1 RSW (10 days)	<ul style="list-style-type: none"> to be studied for CHs in different locations (high vs low latitudes) different opportunities along the orbit: high-latitude windows + perihelion to be studied in different solar cycle phases Earth view before the observations would be asset to use modelling to define best target radial alignment with SPP is a plus 	<ul style="list-style-type: none"> During RSW pre-window synoptics needed for target choice VSTP updates needed for target tracking EMC quiet for connectivity 	radial alignment with SPP is a plus
1.2.2.5 Magnetic reconnection in the chromosphere, the transition region and the corona					
	Quiet Sun at various latitudes.	several days	low + high latitue, to be repeated along the cycle	<ul style="list-style-type: none"> during RSW feature tracking 	<p>Only PHI, EUJ/HRI and SPICE really necessary for this goal.</p> <p>PHI/HRT mode 2 with 5-10 min cadence, 5 quantities and no binning</p> <p>EUJ/HRT follows cadence of PHI</p>

To be discussed whether any of the following can be linked:

1.1.3.1 Fine structures in the photosphere (Full characterization of photospheric magnetic fields)

1.1.3.3 What is the distribution of the open magnetic flux?

1.2.1.7 Detect and characterise waves in closed and open structures