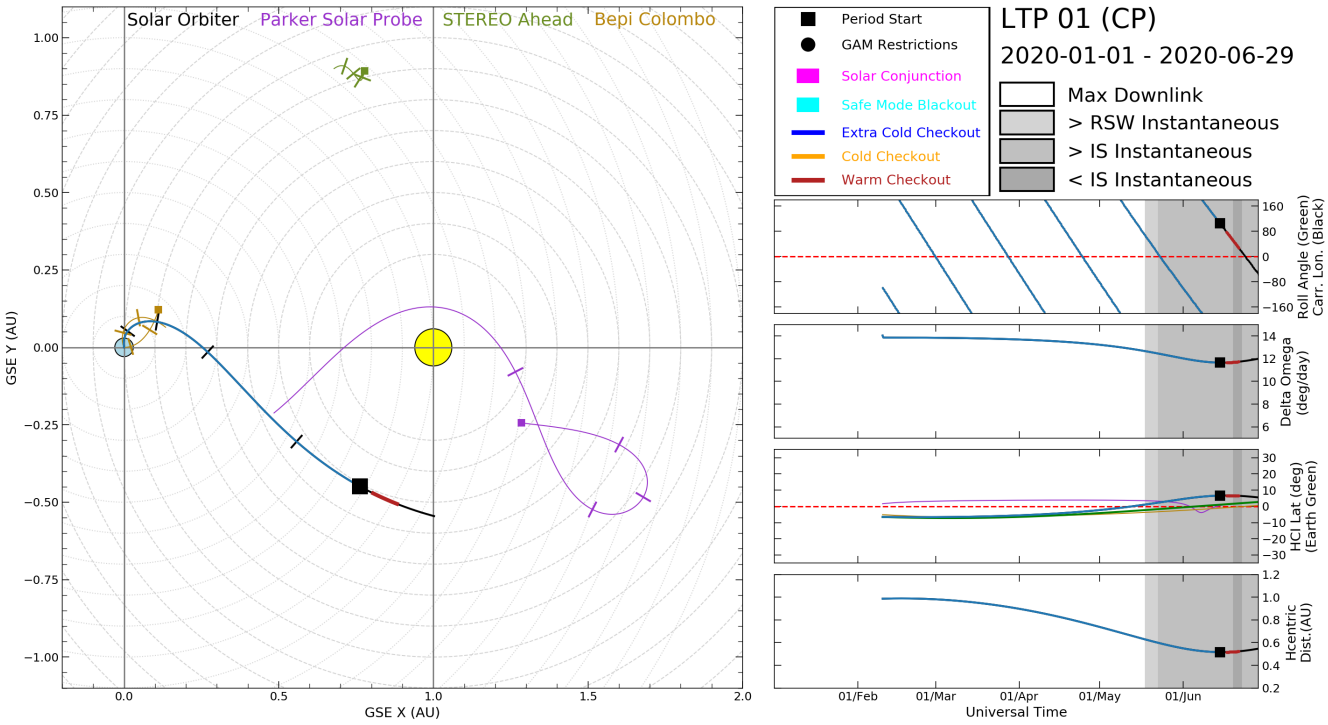
LTP01 May 2020-June 2020

Orbital context

Plots are in GSE (geocentric solar ecliptic) coordinates, so Earth is at [0,0], the Sun is at [1,0]. The plot is the projection of the orbit on the ecliptic plane.



Animated version: Orbit_LTP01.mp4

New definition for the grey shading representing downlink rates:

- *white = maximum downlink rate at which you can empty the SSMM in ~10 days*
- *light-grey = SSMM fill state decreases with everyone operating at EID-A rates*
- *mid-grey = SSMM fill state increases within RSW (10 instruments operating) and decreases outside RSW (IS-only breakeven rate < downlink rate < inside-RSW breakeven rate)*
- *dark-grey = SSMM fill state increases with just IS operating (downlink rate < IS-only breakeven rate)*

RS checkout window placement

Period	Window/ GAM	EXT Start	Start	End	Heliocentric Distance Range [AU]			Heliographic Latitude Range [deg]			SC-Sun-Earth Angle Range [deg]			Conjunction	Safe Mode Comms Blackout	Largest Comms Roll	GAM Restrictions
LTP 01	**RSCW1** (warm)	n/a	2020-06-17T00:00:00	2020-06-22T00:00:00	0.514	0.517	0.523	6.57	6.50	6.31	66.57	71.80	76.91	no	no	0 (TBC)	no

Science and calibration planning

Start of IS science + first opportunity for RS payload to characterise and calibrate the instruments.

- IS modes: The Downlink can support generation at EID-A rates until the end of the planning period. Additional telemetry can be generated early in the period, however this cannot be kept back for perihelion, for example.
- ~~**MAG calibration roll:** to be scheduled in window 2020-05-22T00:00:00.000Z - 2020-05-25T00:00:00.000Z (heliocentric distance ~0.58 AU)~~ (has been moved to LTP02)
- RSCW1: first block of instrument specific characterisation and calibration campaigns

Coordinated campaigns (updated at SOWG #14 - July 2019, and after receiving final MOC input):

- RSCW1: PHI+EUI coordinated **Offpointing Mosaic for Flatfielding** with FDT and FSI (campaign details in TN-0019). This campaign was originally (MLP) scheduled at 2020-06-18T06:00:00, but got shifted to start 2 hours earlier (2020-06-18T04:00:00 - 2020-06-18T05:00:00) in order to avoid overlap with the confirmed ESTRACK pass.
- RSCW1: **Limb Pointing RS-Alignment campaign** (TN-0035), tailored for high-resolution telescopes SPICE, PHI/HRT and EUI/HRI, involving limb pointings to N,S,E,W + disc centre. The whole campaign takes 8,75 hours, driven SPICE durations of full scans (100mins).
  Scheduled at 2020-06-20T00:00:00 - 2020-06-20T08:50:00
- RSCW1: **Metis/SoloHI Cross-like Straylight Calibration campaign** (TN-0036), involving small offpoints limb-to-limb. Campaign design consolidated at SOWG#14, will take 5,5hrs in total and encompasses 22 pointing positions along the 4 cardinal directions.
  Scheduled at 2020-06-21T15:30:00 - 2020-06-21T21:05:00
- Before RSCW1: coordinated **Star Calibration campaign** (TN-0037) between Metis, EUI/HRI and SPICE, featuring alpha Leo. The S/C will be pointed at the limb around the time of the star's ingress and egress. EUI/HRI will observe at both positions, SPICE only at the latter.
  Scheduled at 2020-06-15T07:40:00 - 2020-06-17T00:00:00 .
  Note that right after alpha leo, also rho leo will pass through the Metis FOV. Metis plans to observe rho leo during the first day of RSCW1.

Updates made to the plan after SOWG #14

The planning of LTP01+02 was not completely finished at the end of the SOWG meeting. The following updates were made in agreement with the affected instrument teams.

1. Metis timeline for RSCW1 was updated in order to reduce their overall TM volume. They proposed to reduce the number of off-pointings in the straylight campaign from 34 to 22, rather than reducing from 2 to 1 exposures per pointing. This meant that the pointing events needed updating, the Metis timeline associated with those pointings, too, and that SoloHI's timeline for the same coordinated campaign needed updating.
    a. In order to do this, SOC removed pointings from the start of the series, so that it ended at the same point as before and that Metis (at least) could extend their LT CONFIG observations a little longer (much lower data rate). Metis ObsID affected is SMET_010A_CC1_114_juZA_111 . Old SCI volume was 308.037 Mbit, now 199.318 Mbit.
    b. Slews were deleted from the one at 2020-06-21T15:25:00 up until (and including) the slew at 2020-06-21T18:15:00
    c. POINT_PATTERNs deleted from 2020-06-21T15:30:00 until 2020-06-21T18:15:00 (inclusive)
    d. METIS_VL_ALI now lasts for 19500 seconds starting at 2020-06-21T18:30:00Z
    e. SMET_010A_000_000_NBFk_112 (LT_CONFIG) was extended to meet the first slew in the remaining pattern, and now finishes at 2020-06-21T18:25:00Z
    f. SoloHI observation HI_CALIB_SAA is placed on the timeline for each pointing, so we removed those observations co-ordinated with the now-deleted Metis pointings: from SSHI_010A_CC1_114_iLJQ_111 (started at 2020-06-21T15:30:00Z) until SSHI_010A_CC1_114_iLJQ_11C, inclusive (started at 2020-06-21T18:15:00Z)
2. Metis also no longer participates in the EUI/PHI FF campaign, to save telemetry, so VL_UV_FF observation SMET_010A_CC1_113_p1RJ_111 was removed.
3. As requested by the SoloHI team after review of the updated plan, the following adjustments were made (versions 494-503):
    a. To compensate for the 'lost TM' during the omitted 12 offpointings (in point 1 above), we added a 2-hr generic calibration campaign for 24MiB on 21 June at 16:00
    b. To properly account for HK and power in the idle periods during RSCW1, we filled up the timeline with HI_IDLE_OUT operations.
4. SPICE_COALIGNMENT observations from SOOP CC1_111 needed to be reduced in size from 3 windows to 2, reducing them from 51 MiBytes to 35 MiBytes.

    a. Affected ObsIDs are SSPI_010A_CC1_111_7KZY_11B to SSPI_010A_CC1_111_7KZY_11F (inclusive).
5. EUI took care of the updates to be made to their timeline. These updates mainly consisted in adding the missing FSI synoptic campaigns in between calibrations and reviewing flushes.
6. We found an error at the end of the SOWG, with too high a PHI flush volume that had not been taken into account in the simulation, and could not be supported. It was agreed with PHI to return back to the original.
7. No updates were required for STIX or the *in situ* payload instruments after the SOWG.
8. Heat-shield door operations were added once all instrument observations were agreed.

SOOP Kitchen plan

- Status after SOWG#14 (split for LTP1 only): https://solarorbiter.esac.esa.int/soopkitchen/#/planning/plan/LTP01_May2020-Jun2020/10 (= indicative only, as the final event files will only become available after launch)
- Final plan: update after final FECS&PTEL received 5 May : https://solarorbiter.esac.esa.int/soopkitchen/#/planning/plan/LTP01_Jun2020-Jun2020 (planID 012A)
  LTP1 output data (EFECS, TMCs and JSON timelines) have been delivered to the instrument teams by GFTS on 8 May 2020