

MLP of Cruise during SWT#26b (Mar 2020)

Original plan (before SWT #27 meeting cancellation, and before the intermission of the commissioning activities)

During SWT#27 we will revise the Mission Level Planning for the Cruise Phase, for the period Jan 2021 to the end of Cruise (Nov 2021). The year 2020, i.e. LTP1 and LTP2, have been planned already at long-term-planning level and will not be discussed.

The SAP for Jan-Jun 2021 (LTP03) will need to be frozen, i.e. primary science goals (for in-situ) and locations and content of RS checkout windows will be fixed. This is so we can produce our input for the ESTRACK Users Group (ground station passes) due mid May 2020.

Note that SWT#27 will not be a physical meeting due to the measures regarding the COVID-19 pandemia. It will be replaced by a series of PI telecons and information distributed over email.

Schedule of alternative planning to SWT #26b meeting

We will do an iterative process with the Project Scientists and the Instrument Teams in order to reach the same output as in the original SWT planning meeting. The proposed schedule is:

- **20 March:** Initial proposal by the SOC distributed to the PIs (includes already a round of consultation with the Project Scientists and relevant external community like PSP).
- **26 March:** PI telecon at which a first discussion can take place. SOC can also make a presentation of the proposal.
- **3 April:** Comments and feedback from instrument teams received by the SOC.
- **17 April:** Modified MLP plan factoring in feedback produced by the SOC.
- **Until mid May:** Possibility for further iterations if needed.
- **Mid May:** Ground station request sent by SOC to Flight Control Team, as input to the ESTRACK User Group which meets at the end of May.

FYI - Preparatory work done by SOC prior to PI telecon of 26 March: Initial proposal.

- The existing plan for the Cruise Phase, as built in SOOP Kitchen during [SWT#24 \(April 2019\)](#) has been revised by SOC and upgraded to
 - be compatible with the new observation definitions provided by the instrument teams (only minor updates: RPW and SWA/HIS observations have new datarates, Metis has new observation METIS_IDLE)
 - be consistent with the new orbit file, i.e. the dates of GAMs and conjunctions have slightly shifted
 - The upgraded plan is available in SOOP Kitchen: https://solarorbiter.esac.esa.int/soopkitchen/#/planning/plan/MLP_Cruise. Note that the old MLP plan (called "MLP Feb 2020") will be kept but archived.
- The description of the content of [LTP03 \(Jan 2021-June 2021\)](#) and [LTP04 \(July 2021-Dec 2021\)](#) on SOC public, has been updated. Remaining questions, or inconsistencies with SOOP Kitchen, have been highlighted in red.

Action - Required planning:

- Review the main campaigns in Cruise Phase plan in SOOP Kitchen (check whether any important campaigns are missing)
 - Discuss the coordinated campaigns scheduled throughout the year 2021, up to the end of Cruise.
 - Discuss any campaigns to be coordinated with external parties or other missions.
 - Review the location of all the RS checkout windows (2, 3, 4)
- Review the context pages [LTP03 \(Jan 2021-June 2021\)](#) and [LTP04 \(July 2021-Dec 2021\)](#). Pay special attention to **text marked in red**, as these are the remaining open points.

Initial discussion at the PI telecon of 26 March

- SOC presentation of the Cruise plans for 2021 has been held through Confluence. Following pages have been shown and commented upon:
 - [this page](#)
 - [Working assumptions for science operations planning given the commissioning intermission](#)
 - [LTP03 \(Jan 2021-June 2021\)](#)
 - [LTP04 \(July 2021-Dec 2021\)](#)
 - [SO-PSP Coordination WG](#)
- Discussion of the remaining questions or open points.
- Conclusion: PIs will review the current plan and send in a first round of feedback by 3 April. We may need several iterations to update the plan. Next coordination meeting will be held as part of the following PI telecon on 16 April 2020.

Comments and feedback from instrument teams (1-8 April)

- [Feedback from ISWG meeting 31 March](#): ISWG are happy with the current mission level plan for LTP3. There may be some changes coming up for LTP4 to take advantage of being close to Venus at the same time as Bepi, but that needs some more thought and iteration with MOC once things have calmed down.
- [Feedback from RSWG \(email F.Auchere_3 April\)](#): Due to the fact that Sigma Sgr will not be occulted in current SC orbit, Vincenzo and Luca re-assessed the possible star targets for both Metis, SPICE and the HRI-Lyman alpha telescope of EUI. As the high resolution instruments have a small FoV there are very few opportunities, and some have changed with the launch date changing from February 6th to 10th. The technical note has been updated to reflect the new situation: https://docs.google.com/document/d/1SMTSZ8zMq2uZLygVz5hNc__Mm0MjW6iARWeViVnCMn0/edit#heading=h.4d34og8
 - In 2021, there is an occultation of **Phi Sgr on 11 April 2021**, around the same time as the initially planned observations of Sig Sgr. However, this star is significantly fainter than Sig Sgr.
 - Our preferred target would therefore be **theta Ophiuchi on 27 March 2021**.

- For the three instruments involved, the occultation of **alpha Leo (16 June 2020)** remains an extremely desirable opportunity we hope can be maintained. **If alpha Leo cannot be observed this June**, we would then like to propose also the observation of **Omega Scorpii on 16 March 2021** so to have the opportunity to fine tune the observation parameters before the Theta Ophiuchi opportunity.
- For Metis, who doesn't need S/C offpointing and has a large FoV, **Sigma Sgr (8-14 April 2021)** remains a very important target.
- *LTP3 page has been updated assuming alpha Leo observations can still take place:
The coordinated campaign featuring theta Ophiuchi has been added to the plan, and the campaign featuring Sigma Sgr has been limited to Metis only.
SOOP Kitchen plan has been updated consistently.*
- **Feedback from PHI team:**
 - PHI confirms schedule of EUI+PHI flatfielding campaign + PHI will not take part in star calibration
 - PHI is interested in taking part in roll campaign during RSCW2 but has no TM to spare. If extra TM would be available at time of long-term-planning of LTP3, PHI would be interested to add observations.
 - PHI has important campaigns scheduled during end of NECP and RSCW1 that test PHI science processing.
If RSCW1 cannot take place as scheduled, the results obtained from RSCW2 will be of highest importance in order to fine tune calibration parameters and to react on any issues (which otherwise would have been already seen in RSCW1 since both are at 0.5 AU). Because of the short distance between RSCW2 and RSCW3 and the expected high latency, we will have only limited possibility to react on issues obtained in RSCW2. The idea would be to extract as much as possible from RSCW2 and then retry all operations in RSCW4 (and early NMP). This means, an increase of TM for RSCW2 and extension of operations in RSCW4 would be of highest priority for PHI.
 - *LTP3 page has been updated according with feedback in first 2 bullets. 3rd point would need a discussion in SWT (or PI telecon) if RSCW1 would not take place as planned.*
- **Feedback from SPICE team (e-mail from F. Auchère, 5 April 17:04):**
 - SPICE sent an itemised list of updates covering RSCWs 2, 3 and 4
 - MLP for LTP03 needs to be updated
 - to include FUNCTIONAL (1.0 MiB) and THRUFOCUS_SPATIAL (10.0 MiB) observations (which were not available at time of MLP planning for Cruise, but were available by the time of Long-Term Planning for 2020).
 - with minor tweaks to volumes and some adjustments in durations.
 - Total difference in volume is an extra 11.32 MiB for RSCWs 2 & 3.
 - MLP for LTP04 needs to be adjusted to reflect much more volume (419.8 MiB), principally for flat-fielding and co-alignment campaigns.
 - *SOOP Kitchen has been updated for LTP03, with no additional information added to LTP3 page since it did not affect campaigns in that period.*
 - *Changes to SOOP Kitchen in LTP4 and LTP4 page still to be updated.*
- **Feedback received from EUI (email C. Verbeeck, 6 April)**
 - EUI stresses the importance of RSCW1 and the star calibration featuring Alpha Leo. Assumes in updates below that that these can still be accommodated.
 - EUI sent an itemised list of updates covering RSCWs 2 and 4, and clarifications for the open issues in both LTP3 and 4:
 - RSCW2: EUI's contribution to roll campaign needs updating, FSI_SYNOPTIC_B is not adequate
 - RSCW4: flatfielding campaign currently scheduled includes TM for two flatfielding campaigns: one for FSI, one for HRI.
 - RSCW4: EUI clarifies that the coordinated campaign currently scheduled on 2021-09-24T19:00:00, should be moved to 2021-09-29 as contribution to Metis offpointing campaign
 - RSCW4: EUI proposes to add 6 hours of FSI_SPROUT to last day RSCW (+flush)
 - RSCW4: EUI proposes to synchronize observations with STEREO as they share LOS
 - LTP4: clarification that annealing campaign would be needed in case of strong degradation and would need much TM to be effective
 - *LTP3 and LTP4 pages have been updated accordingly. Updates in SOOP Kitchen plan done for LTP3, LTP4 updates drafted in child plan*
- **Feedback received from Metis (email M. Romoli 7 April, with additional responses from M. Romoli 14 April)**
 - Metis confirmed the plans in general and provided some extra details about the open issues in LTP3 and 4
 - Following additional campaigns are proposed during LTP4:
 - Test SPROUTS
 - Double Venus fly-by by BepiColombo and Solar Orbiter in August 2021
 - Joint SOLO-PSP campaign with PSP at perihelion going (11-21 Nov. 2021)
 - *LTP3 page has been updated:*
 - RSCW2: Additional VL_BFF, UV_DA1 and UV_DA2 added before Metis HSD is opened
 - CC1_119 (Metis/SoloHI roll campaign) was moved back by 2 hours to allow time for these to complete before the campaign begins
 - METIS_GLOBAL shortened to offset increase in TM due to these observations
 - RSCW3: Additional UV_DA1 and UV_DA2 added after VL_BFF, and before Metis HSD is opened
 - METIS_LTCONFIG shortened to offset increase in TM due to these observations.
 - *LTP4 page and SOOP Kitchen updates for LTP4 still pending.*
- **Feedback received from SoloHI (email R. Howard 7 April)**
 - SoloHI confirmed 30 mins dwell times during roll campaign RSCW2
 - *LTP3 page has been updated accordingly. The duration of the roll campaign in SOOP Kitchen and the associated SoloHI contribution have been adjusted accordingly.*

PI telecon of 16 April

- Review changes made on SOC Public and SOOP Kitchen following the feedback from all instrument teams (see above)
- Decide on the way going forward from the current state
- Conclusions:
 - Plan has been reviewed by the instrument teams and confirmed valid. Deadline for any remaining feedback is 20 April.

- SoloHI will confirm whether the door opening campaign at start RSCW2 can be removed (done by email on 22 April)
- After April 20, SOC will start simulating the mission level plan, to confirm feasibility of the schedule. Also, SOC will explore whether extra TM can be given to EUI and PHI to participate in roll campaign during RSCW2.
- Simulations will be presented at next telecon.

Final consolidation round at PI telecon of 30 April 2020

- Review [Simulation results MLP for LTP3](#), and discuss the assumptions and targets for the LTP boundaries.
- Confirm LTP3 plan, both on Confluence [LTP03 \(Jan 2021-June 2021\)](#), and on SOOP Kitchen ([MLP_Cruise](#)): the **placement of RSCW2 and 3**, timing of campaigns involving **SC manoeuvres** and the **extra RS passes** that will be requested.
- **Define way forward to Formal validation of mission level plan for LTP3**

Update SOOP Kitchen plan and simulations according to final decisions

- SOOP Kitchen plan [MLP_Cruise](#) has been updated with adjusted roll campaign during RSCW2, incl contributions from PHI and EUI. Final baseline = 5
- Simulation has been rerun

(We are here now - work to be done later is below this line)
