

Draft Minutes of the Solar Orbiter Mini-SWT Meeting

ESAC, 23 January 2019

Prepared by Yannis Zouganelis

All presentation files at Solar Orbiter web pages <http://www.cosmos.esa.int/web/solar-orbiter/> ('Science Team' → 'SWT Documents')

See separate minutes for the SOWG #13 (21-23 January 2019).

Start of meeting: Wednesday 23 January at 14:30

- **Introduction:** Daniel Müller welcomed the participants and presented the agenda of this extraordinary meeting focused on the Cruise Phase Plan. An additional point to the agenda regarding data sharing between the instrument teams was added following a suggestion by Tim Horbury.
- **Cruise Phase Plan** ([see presentation by Yannis Zouganelis](#))

Context:

During the SOWG #11 meeting in Madrid (16-18 January 2018), and with the delegated authority given to it by the SWT during SWT #21, we had produced a baseline mission level plan for the entire Cruise Phase based on a February 2020 launch (see SOWG #11 minutes for details). More information on the planning procedure during the SOWG #11 and the plan details can be found in [SOWG 11 Documentation of Cruise Phase Mission Level Plan](#).

At that time the Parker Solar Probe orbit was not yet known with sufficient accuracy and the SOWG agreed to reconvene after PSP launch in order to tweak the plan if needed. This was done during the present meeting. The goal was to take a final decision for the period of the Cruise Phase finishing at the end of June 2020, which includes the first Remote Sensing Checkout Window (RSCW).

Before the present meeting, all instruments had been asked to provide feedback on the current plan. No major disagreement on the plan was expressed as of 23rd of January 2019.

Presentation:

The presentation shown included:

- Brief description of the plan decided in January 2018
- Cruise phase characteristics
- Placement of RSCWs for the whole phase
- Questions that need to be answered
- How sensitive is the RSCW1 on the exact launch date? (presentation by A. Walsh)
- Star calibrations happening around RSCW1 (RSWG input presented by V. Andretta)
- Coordination with PSP (input from SoloHI/WISPR team presented by R. Howard)

Discussion & Conclusions:

During the meeting, we discussed the following questions:

1) Do we keep the number, location and duration of the RS Checkout Windows as agreed in January 2018?

A change was only suggested for RSCW1, which was previously scheduled on 9-14 June 2020 (see presentation by A. Walsh). This was motivated by two main reasons:

- a) Keep the days around the perihelion EMC Quiet. This is not part of any formal requirement; however, it would help the in-situ teams get the best possible results during the first perihelion of the mission. It is reminded that only the in-situ instruments are doing science during the Cruise Phase.
- b) Make sure that the first RSCW is placed with sufficient margin after the end of the commissioning phase (NECP), so its location is robust with respect to changes in the commissioning plan and schedule that may delay the end of NECP. Depending on the exact launch date during the February 2020 launch window (4-24 February 2020), the currently chosen RSCW1 (9-14 June 2020) might start too close to the NECP end. A shift of the RSCW1 to 17-22 June 2020 would be sufficient to account for this problem.

Regarding the coordination with Parker Solar Probe (see presentation by R. Howard), it was noted that the window 9-14 June 2020 is optimal since there is a PSP-Sun-SO quadrature during PSP perihelion. However:

- a) Solar Orbiter would not be very far from the Sun-Earth line, so that remote sensing observations from Earth would be sufficient to support PSP needs
- b) Most of the remote sensing instruments will use this first window for basic calibration activities and would not be ready to sufficiently support PSP science
- c) The SoloHI instrument, which was mostly interested by the quadrature in terms of joint observations with WISPR, confirmed that it would not open its door before RSCW2 due to concerns with contamination
- d) In-situ coordinated science between PSP and Solar Orbiter will still be possible during PSP perihelion as well as throughout the Solar Orbiter cruise phase. Details on the in-situ instruments burst modes will be discussed during Long Term Planning at the next SOWG (July 2019).

Regarding the calibration of Remote Sensing instruments with stars (see presentation by V. Andretta), it was noted that it is important to observe α Leo and/or ρ Leo during one or two days between the 14 and 19 June 2020. The exact dates are dependent on the exact launch date. Regarding the placement of RSCW1 in order to account for this uncertainty on the dates, there are two possibilities:

- a) Place RSCW1 exactly on 14-19 June. This has the disadvantage of starting too close to the end of NECP and/or to the perihelion as previously explained.
- b) Ask the Project an exception to operate the needed remote sensing instruments during the required days independently of the RSCW1. Since this would include instrument pointing operations, a special agreement is needed at Project level. The Project Scientist took the action to further explore this possibility.

The Remote Sensing Working Group took another action to confirm the above-mentioned dates and improve the analysis relative to calibration with stars by the next SWT meeting in Florence (April 2019).

Finally, it was noted that there is a small margin of a few dates in the choice of the exact dates of the RSCW1 and that it would be possible to adjust it after launch. This requires the ground station passes to be scheduled

after the latest possible date of the end of the RSCW1 in order to make sure that such an adjustment would be possible without severe penalty on the telemetry return.

The finally agreed remote sensing checkout windows are:

- **RSCW1: 17 – 22 Jun 2020 – 5 days (within the margin discussed above)**
- **RSCW2: 20 – 25 Feb 2021 – 5 days**
- **RSCW3: 21 – 24 Mar 2021 – 3 days**
- **RSCW4: 22 – 30 Sep 2021 – 8 days, daily passes**

2) Do the in-situ instruments agree with where their telemetry is focused across the entire Cruise Phase?

The in-situ instruments introduced small adjustments on their telemetry priorities during the entire Cruise Phase after discussion at the in-situ working group on 21 January 2019. In addition, SOC took the action to explore the possibilities of increasing the in-situ data rates during the whole cruise phase in order to minimise the time spent in low rate mode. These changes will be fed into the plan that will be presented for final validation at the SWT #24 in Florence (April 2019). Further details will be discussed at Long Term Planning at the next SOWG in July 2019.

3) Has anything changed in the calibration plans (in particular for RS instruments) that would mean that the current plan for the cruise phase would no longer be feasible?

No instrument expressed a particular change regarding the calibration plans that would affect the first 6-months period of the Cruise Phase. An exception is the calibration with α Leo and/or ρ Leo stars explained above.

The outcome of the above-mentioned actions will be presented at SWT #24 in Florence (2-4 April 2019) and the final plan will be formally approved. After April 2019, there will be limited possibility to change the plan for the period of the Cruise Phase ending on 30 June 2020.

- **Ad hoc discussion on data sharing between the instrument teams**

Following a suggestion by Tim Horbury, a short discussion was held regarding science data sharing between instrument teams during the 3-months period before the data become public, mainly for inter-calibration needs. No conclusion was reached during the discussion, which will be reiterated at another opportunity.

- **AOB:**

- Future meetings:
 - SWT #24, 2-4 April 2019, in Florence, (POC: METIS team).
 - SOWG #14: 9-11 July 2019, ESAC, Madrid.
 - SWT #25 in Kiel, Sep 2019 (POC: R. Wimmer-Schweingruber).
 - SWT #26: TBD (at launch site in Feb 2020).
 - Science Workshop #8 + SWT in Ireland (date TBD, POC: L. Harra, T. Horbury/C. Owen).
 - Science Workshop #9 + SWT in France (date TBD, POC: M. Maksimovic).
 - Science Workshop #10 + SWT in Göttingen, Germany (date TBD, POC: S. Solanki).
- Other meetings of interest:

- "Whole Helio Month" Workshop, Spring 2019 (hosted by NASA HPD in Washington, DC area).
- EGU, Vienna, 8-12 April 2019, with PSP session (abstracts due 10 Jan 2019).
- DKIST-PSP-Solar Orbiter "SUC" Meeting, Spring 2019, USA.
- PSP SWG, June 2019, Univ. of Michigan.
- SHINE, 5-9 August 2019, Boulder, CO (TBC).
- PSP Science Workshop, May 2020 at APL.
- Solar Wind 16 Meeting, June 2021 (Pacific Grove, California, hosted by S. Bale).

End of meeting: 23 January 2019, 17:00.

Annex

List of Participants

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