

Minutes of the 38th SOHO SWT “Executive” Meeting

Held by Telecon

06 November 2007

Agenda

- 1) Operations during the Bogart mission
- 2) Senior Review
 - Science highlights
 - Instrument status
 - Science case for optimal scenario instruments
 - Mission archive plans
- 3) Instrument status
- 4) Future meetings
- 5) AOB

Actions

38-1: on PIs: provide 3-5 science highlights for NASA Senior Review proposal to J. Gurman. Due date: 30 November 2007.

38-2: on CDS, SUMER, UVCS: provide a one-page summary with compelling arguments for optimal scenario. Due date: 30 November 2007.

38-3: on PIs: check the SOHO bibliography at http://sohodata.nascom.nasa.gov/cgi-bin/bib_ui for the time period 2005-2007 and send updates to B. Fleck. Due date: 31 January 2008.

38-4: on PIs: Mission Archiving Plan input: provide plan on how you will provide calibrated data to final SOHO mission archive. Due date: 7 January 2008.

38-5: on PIs: check respective instrument resource pages under <http://sohowww.nascom.nasa.gov/data/archive/instruments.html> and update where necessary. Due date: 15 December 2007.

38-6: on PIs: review and where necessary develop scripts/command sequences/procedures to switch from A to B side. Due date: 31 March 2008

Annexes

Annex 1: List of participants

Annex 2: Changes in SOHO operations

1) Changes in SOHO operations during Bogart mission

The changes in SOHO operations during the Bogart mission are summarized in Annex 2. The exact modus how science operations will be done during the Bogart phase are still TBD. No instrument team sees problems regarding the changes outlined in above document. The remaining lifetime of SUMER detector B may be longer than anticipated and SUMER may be operational in 2009 and beyond. SUMER therefore may be part of the optimal scenario which will be part of the SOHO proposal to the NASA Senior Review. J. Gurman stressed that DSN support is expected to be significantly reduced during the Bogart mission making it difficult to continue with all instruments.

2) NASA Senior Review

J. Gurman is asking for contributions from all instrument teams for the NASA 2008 Senior Review (SR):

- 3-5 science highlights per instrument by 30 November (Action 38-1).
- One-page descriptions from the optimal scenario instruments (CDS, SUMER, UVCS) with compelling arguments for why to keep them operating (due also by 30 November, Action 38-2).
- Updated publication lists (Action 38-3)
- A plan for providing calibrated data for the final mission archive (Action 38-4).

The text for the SR should be terse, but can be supplemented by additional material. A draft of the SR proposal will be ready by early January 2008 for circulation and further iterations. The input will also be used for the next ESA extension proposal.

Data usability and mission archive plan

Availability and usability of mission data will be another key criterion for the NASA SR. The PI teams are therefore requested to check their instrument resource pages and update where necessary (Action 38-5). This should be done rather soon, as an independent panel is expected to start their activities later this year. Information about the calibration procedures should be included, as well as pointers to the articles in the SOHO intercalibration book and other calibration papers in ADS. The SOHO PS team will check if the contents of the SOHO intercalibration book can be digitized and included in the SOHO web pages. Level-0 (uncalibrated) data will be kept in parallel to the calibrated data. For the US PIs J. Gurman would like to know what level of support is needed to provide calibrated data.

The mission archive plan is required by the NASA Heliophysics Science Data Management Policy (http://lwsde.gsfc.nasa.gov/Heliophysics_Data_Policy_2007June25.pdf). A final mission archive with calibrated data is required also by ESA. The SOHO AO (ESA SCI(87)1 & NASA AO-OSSA-1-87, Chapter 8.3 Data rights, p. 38) reads:

Finally, for STSP, each investigator must agree to and plan for the disposition of reduced, calibrated science data in usable form into a data centre designed by ESA and/or NASA. [snip]

The proposer should clearly state in his/her proposal that he/she is prepared to accept this data policy. In the absence of any statement, the proposer shall be deemed to have accepted the policy.

3) Instrument status

GOLF:	no change
VIRGO:	no change
MDI:	no change
SUMER:	Detector B seems to have reached a plateau; restrictions on use of azimuth have been lifted last November
CDS:	no change
EIT:	no change
UVCS:	both detectors show ADC problem; about 10-15% of photons end up in wrong detector row; degradation: all of Ly α detector still usable, ~1/3 of O VI detector not usable anymore
LASCO:	no change
SWAN:	no change
CELIAS:	no change
COSTEP:	not represented
ERNE:	no change

4) Future workshops

- SOHO-21/GONG 2008: Solar-stellar dynamos as revealed by helio- and astero-seismology, 11-15 August 2008, in Boulder, CO
- suggestions for a SOHO+SDO and/or a SOHO+ STEREO workshop in 2008 or 2009
- John Kohl and Steve Cranmer suggest a "Solar Minimum" meeting in Maine for 2008 (10 years after SOHO-7)

5) AOB

It was agreed to hold the next SOHO SWT meeting in conjunction with the AGU/SPD meeting in Fort Lauderdale, FL, which will take place May 27–30, 2008.

Annex 1

List of Participants

<u>Name</u>	<u>Experiment</u>
F. Auchère	EIT
J.-L. Bertaux	SWAN
W. Curdt	SUMER
A. Fludra	CDS
C. Fröhlich	VIRGO
A. Gabriel	GOLF
L. Gardner	UVCS
T. Hoeksema	MDI
R. Howard	LASCO
F. Ipavich	CELIAS
B. Klecker	CELIAS
J. Kohl	UVCS
E. Valtonen	ERNE
A. Vourlidas	LASCO
H. Benefield	B. Dutily
B. Fleck	J. Gurman
T. Kucera	D. Mueller
J.-P. Olive	L. Sanchez
T. Siili	G. Westenburger
T. van Overbeek	E. Zamkoff

Annex 2: Changes in *SOHO* operations

2007 October 30

J.B. Gurman

There will be significant differences in *SOHO* mission and science operations between the way we operated for over 11 years, and the way the “Bogart” mission will be carried out. Some of those changes have already begun. We outline below what some of the major differences will be, and note some of the features that will remain unchanged. All of these changes are driven by the sharply reduced NASA budget levels for *SOHO* discussed at the 2006 May SWT meeting, and the fact that NASA’s interest in *SOHO* operations past mid-2009 are limited to earth-Sun line coronagraph imagery.

1. Phasing

Although the exact dates remain undetermined, we expect to close down the EOF as currently constituted by late summer, 2009. The break point will come when *SOHO* MDI and SDO HMI have completed a long series of intercalibration exercises, including a continuous contact campaign for MDI. SDO launch is currently scheduled for no earlier than 2008 December, and will be followed by a commissioning period, so it will take several months to accomplish all the intercalibration goals. When the Bogart mission begins, we will not only be without our traditional EOF, but also forced to operate with severely constrained telemetry.

In part, the telemetry reductions will be due to the closing of the DSS-46 (Madrid) and DSS-66 (Canberra) 26-m antennas, which date back to the Apollo program. Although current DSN plans call for shutting down the antennas in 2008 October, Chuck Holmes of NASA HQ has insisted that at least one will remain operational throughout the MDI-HMI intercalibration period.

Even though DSN is upgrading a 34-m antenna at each site to enable uplink with *SOHO* (and we should be testing DSS-45 for this capability in the near future), those antennas are already heavily subscribed and in fact support the STEREO mission. Each STEREO spacecraft has several hours (4, soon increasing to 5 as the distance to the spacecraft increases) of DSN contact daily for the downlink of recorded data, and those overlap the “morning” and “afternoon” parts of any *SOHO* contact. Thus, our contacts will have to grow shorter as we lose 26-m antenna support at those sites.

2. Intermittent recording

We currently use “intermittent” recording to record only some instruments’ data on the SSR during the depths of 70-m keyholes. Given NASA’s stated interest only in LASCO data, this means a “VGNFHL6” (VIRGO /GOLF /SWAN /CEPAC /CELIAS /LASCO submode 6”) scheme that would allow recording up to 22.7 hours of data on the SSR, so a single, two-hour contact daily would be sufficient to cover our needs. (The other instruments listed for this mode add negligible amounts of telemetry to the LASCO bandwidth, so it is no stretch to include them routinely.) Including any of the other instruments’ (SUMER, CDS, UVCS) telemetry brings us correspondingly closer to the current situation. In Section 7, below, we discuss the impact of adding one or more of those instruments to the Bogart mission mix.

3. Unattended contacts

Since 2007 September, Deep Space Network (DSN) contacts with the spacecraft during local nighttime have been automated, using the “POLARIS” system devised by the FOT, as well as a commercial product (Attention!) for pager/phone/e-mail notification. (There were three months of automated night contacts before that date, but there were FOT members present to troubleshoot.) During the Bogart mission, *all* contacts except those at which orbit trim maneuvers and/or stationkeeping will be performed will be unattended, though the Observatory Engineers, who will make up most of the Bogart mission FOT, will nominally be across the hall in their offices during local daytime contacts, so their response time will be correspondingly shortened — though in general, we have found that rapid responses are not critical to spacecraft safety.

Without telemetry virtual channel transitions for MDI, the FOT estimates that the only overhead in a normal, unattended DSN contact will be 10 – 15 minutes of pre-dump, signal acquisition activities.

4. Further efficiencies

If we turn off the roll steering law, the spacecraft will be aligned with ecliptic N-S, rather than with the solar rotation axis. Doing so would not only save the overhead of RSL updates (which can also introduce operational errors), but would reduce the number of star tracker updates to four per year (at the time of the 180° rolls), and thus reduce our dependence on the Goddard Flight Dynamics Facility. We would still have full roll accuracy from the star trackers, and that information would continue to be available to the experimenters to include as metadata in their files. The SDO project is satisfied that rotating the LASCO images produced without RSL would not degrade the images in a significant way for their use.

5. The EOF and EAF

As mentioned above, we foresee closing the EOF in its current form in late summer/early autumn of 2009. There will have already been, by then, a gradual reduction in SOC support to the minimum necessary for MDI-HMI intercalibration, so campaigns and JOPs in late 2008 and 2009 will have to be planned and coordinated without SOC support. The “dungeon” with the remote experimenters’ IWSEs should remain where it is.

The parent organization for solar physics at Goddard, the Heliophysics Division, plans to move the remaining EAF-based personnel to, as well as housing the remaining *SOHO* instrument operations and the SDAC, in the Division’s home in Building 21 at the beginning of US fiscal year 2010 (2009 October). (A new “science exploration” building is under construction for every other part of space science, but it is not planned that Heliophysics will move to that facility.) We will retain our Open IONet connection in the new location, so no network address changes are expected.

Joan Rurka, the EAF administrator, will soon be moving over to work more than half time with the Heliophysics Division in Building 21. She will continue to support our security/visit badging requirements, and should remain our point of contact for these issues through at least 2009.

The EOF in the Bogart mission will thus consist of a single, secure office in Building 21 where LASCO is operated. If more instruments are operated locally during the Bogart mission, we will request additional office space for them – but space in Building 21 is limited, so we cannot expect the current total (EOF plus EAF) space that we currently enjoy.

6. Contact frequency

For spacecraft and instrument health and safety, we will require at least one contact per day. NASA's space weather partner agencies in the US have expressed a strong desire for no more than eight-hour gaps between contacts, in order to provide speed determinations of all but the two or three fastest CMEs of a cycle. We have no idea if DSN will continue to be able to support us with thrice-daily SSR dumps, but the shorter our contacts are, the more likely it will be that they can fit us into their schedule.

We are about to start testing making near-realtime COSTEP relativistic proton data available so that parties interested in proton event prediction can validate the method of Posner. In the rosiest scenario possible, NASA Could greatly increase the daily DSN contact duration to enable near-realtime prediction of SEP events, but we currently see no indication that the resources exist to support that scenario.

7. Options

The Senior Review process calls for “bare-bones” proposals for minimal extension budgets, but also allows for the submission of “optimal” budgets for enhancements. An obvious candidate in this year's review is for the continued operation of one or more additional instruments. If NASA proves unwilling to fund those operations, it is still possible that ESA, through the provision of New Norcia contact time, might enable us to increase the amount of data we could recover each day – but the additional instrument operations would have to be funded by national funding agencies, not NASA.

It is important to understand that the FOT scoped by NASA for the Bogart mission is not one that will have the capacity to respond to frequent limit violations by instruments other than LASCO. (The low-bandwidth instruments included in the nominal intermittent recording scheme already meet this criterion.) An instrument team proposing to continue operations should show how they are plan to modify their limits to prevent violations in all situations except those that could endanger the mission. If that cannot be done, it will be reflected in an increase in cost to NASA for additional FOT personnel, which is unlikely to help the chances of such a proposal.

Given NASA's current and growing focus on network security issues, it is unlikely that truly remote commanding (transmission directly from a remote IWS to the CMS system, which is on the Restricted IONet) will be allowed in the Bogart mission. We therefore expect that any team proposing to operate with near-realtime commanding will have to have a presence at the new EOF, even if the command loads are composed remotely.

Adding CDS alone to the "minimal Bogart" intermittent recording mix will decrease the recording capacity to 14.8 hours; adding UVCS alone will decrease it to 18.4 hours. Adding both will reduce the capacity to 12.6 hours.