Table of Contents

SoD List

- Anshika Singh, Stasia Kuske, Surajit Mondal, Brian O'Donnell, Ivan Oparin, Louis Seyfritz, Meiqi Wang, Yuqian Wei, Mallory Wickline, Peijin Zhang
- Each SoD is in charge of a two-day period. Please refer to the "OVSAs SoD Calendar" for assignments.
- Contact points
    - EOVSA: Owen Giersch, Caius Selhorst, Sijie Yu
    - OVRO-LWA: Peijin Zhang, Bin Chen

Daily Routine for SoDs:

- [**Beginning of the day**] Monitor the EOVSA reference calibration observation on helios. View the timing of the calibration using the observing schedule on this page. *Instructions on how to view the stateframe can be found at the end of the document*. Notify Owen/Caius EOVSA - Observing Status via the "observing" Slack channel if anything goes wrong.
- [**Beginning of the day**] Check the EOVSA reference calibration results from the previous day using these plots. Phase coherence in frequency (pcFyyyymmddhhmmss_source.png) should be expected for good calibrations (see note #1 below). Notify Owen/Caius via the "observing" Slack channel if anything goes wrong.
- [**Beginning of the day**] Check if the OVRO-LWA beam spectrogram and hdf image data from the previous day have been fully transferred to pipeline
    - Beam spectrogram data are stored under: pipeline:/nas7a/beam/beam-data/yyyymm/beamyyyymmdd/. Usually we have 8-10 files. The first file starts from 14 UT or so, the last file starts from 00 UT from the next day.

    - HDF image data are stored under: pipeline:/nas7/ovro-lwa-data/hdf/slow/lev1/yyyy/mm/dd/. The typical number of files is 3000+. Check the timing of the first and last file.
    - Whenever in doubt, check with OVRO-LWA contact points to compare the size/number of files between the source and destination folders.
- [**Hourly**] Check the latest EOVSA spectrogram and images (once they are available) at https://ovsa.njit.edu/status.php# for quality assurance. The typical amplitude level in the "Latest EOVSA Dynamic Spectrogram" should be around 200-300+ (in arb. units). A significant deviation (<200 or >400) may indicate an issue—such as some antennas not tracking properly. Report anomalies at the "observing" Slack channel and tag Owen, Caius, Sijie, Bin.
- [**Hourly**] Check that the OVRO-LWA real-time beamforming spectrogram and slow visibility (OVRO-LWA-352) images (at http://ovsa.njit.edu/status.php#) are flowing and producing the expected results. For the images, check if there is one image every 1 minute for slow visibility (OVRO-LWA-352). Consistently missing frames usually means either the recording or the imaging pipeline is not working. Consistently missing panels (but other panels are available) usually means failed subbands. If anomalies occur, send a message to "observing" Slack channel and tag Peijin and Bin.
- [**Hourly**] Identify any notable events. For EOVSA, watch for flares at http://ovsa.njit.edu/status.php#, https://ovsa.njit.edu/flaremon/, and compare to the GOES X-ray light curve. For OVRO-LWA, in addition to signatures associated with EOVSA flares, type II bursts and CME-associated events are of primary interest. Send a message to the "observing" Slack channel to notify people.
- [**Daily**] Check the EOVSA daily full-disk synoptic images at https://ovsa.njit.edu/browser/. Add a note in the report if the images are missing.
- [**Daily**] Keep a record of notable things (events, anomalies, downtime) in the SoD observing logs. These entries should be based on our own observations, using EOVSA/OVRO-LWA data as the primary reference. Begin by identifying flares from our data, and then gather contextual information about those events from other sources. Some flares have faint radio signatures. So, going over the GOES flares throughout the day and trying to identify radio signatures would also be helpful to ensure no missed events. Document any additional data (visibility/high-cadence images) saved to the archive.
- [**End of the day**] Send a copy of your SoD daily report to the "observing" Slack channel.
- [**Next day**] Produce EOVSA flare spectrograms for flares that occurred during the day (if any), following the steps detailed in this wiki page. Upload the resulting png and fits files and update the EOVSA flare wiki. Update the "notable event" table in the SoD report.

Add links to the EOVSA and OVRO-LWA spectrograms (showing the corresponding signatures) to the table.

- [**Next day**] NOAA active-region numbers or heliographic latitude and longitude (e.g., N12E49): For each flare that occurred during the day, add the location info to the report:
    - Identify the source active region via Helioviewer (fast, web-based) or JHelioviewer (more powerful, but requires installation).
    - Look up the NOAA AR number on SolarMonitor or LMSAL's latest events.
- [**Next day**] Check the CME catalog for the day after the observation to ensure we didn't miss a weak CME/behind-the-limb CME. Also, review the daily composite spectrogram—particularly the OVRO-LWA spectrogram—located in the bottom-right corner of the EOVSA browser for any weak events. Daily spectrogram and movie of OVRO-LWA data can be found at the OVRO-LWA data query site.
- [**Weekly**] Report your events at the weekly OVSA meetings. Make your contribution to the weekly OVSA observing report.

Write log to Google doc:
https://www.ovsa.njit.edu/wiki/index.php/Owens_Valley_Solar_Arrays#OVSA_Scientist_on_Duty

SoD report template

June 1, 2024 SoD name

1. Report the status/quality of EOVSA reference calibrations from the previous night/early in the morning.
2. Report the data transfer status from the previous day.
3. Report the status of generating EOVSA flare spectrogram(s) from the previous day (if any). Provide a link to the wiki record.
4. Report the status of the EOVSA full-disk synoptic image from the previous day.
5. Report notable flare/CME/radio burst events recorded by EOVSA and/or OVRO-LWA of the day. Include interesting correspondence with events observed at other wavelengths (EUV/white light/X-ray).
6. Report of system/recorder/data anomalies. Provide time periods of the data anomalies and possible causes.

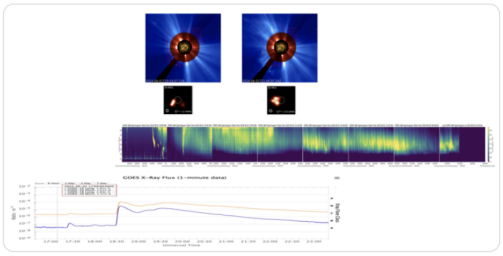
An example report by Sijie Yu

Sijie Yu 10:33 PM

SoD report: Jun 1, 2024 Sijie Yu

1. EOVSA reference calibrations from the previous night and early morning are normal.
2. OVSA full-disk synoptic images from the previous day are in good condition.
3. Two major flares in a row (X1.0 and M7.3) from NOAA AR 13697, peaking at 18:36 and 19:39 UT respectively. The first one produces a slow halo CME. The second one produced a faster CME. This active region is the same one that produced a series of X flares, including an X10 flare a few weeks ago, and has rotated back into view. OVRO-LWA observed a type II burst followed by an over 7-hour long type IV burst. The type IV burst shows three distinct sources in the wake of the white-light CME. EOVSA missed the impulsive phase of the first flare but observed the second flare.
4. Missing time frames in slow visualization images after 20:20 UT. Bin's feedback on the issue is that the reason is currently unknown. (edited)

image.png



Use the following template to record events.

Date/Peak Time	Event Type	GOES Class	Location	Remarks
2025-09-04T19:45	Eruptive flare	C3.4	AR 14206	OVRO-LWA observed type IV-like bursts

Notes:

1. Since June 17, 2024, the phasecal plots have been plotted in red color if there was a windscram of Ant 14 during the observation (otherwise it will be plotted in the usual blue color). The subtitle of the plot will indicate what fraction of the calibration was missed due to wind. If the fraction is small, you should see coherence in the phases anyway, because the dish was tracking most of the time. This color will be an indication of one possible reason for bad coherence, and normally there is nothing we can do about it, so just report it as a windscram. If you see a blue color with no phase coherence, though, then the calibration failed for some other reason and should be reported as such.

General Guidelines for Writing Event Remarks

Each remark should provide a **concise summary (1–2 sentences)** describing what was observed, **by which instrument**, and **its scientific context**. The goal is to capture the key observational characteristics and their relevance to solar activity.

1. Structure

[Instrument(s)] observed [type/intensity/characteristics of radio emission] from [source region or flare] at [time or phase], with [key spectral/temporal/spatial features]. [Mention any associated phenomena (e.g., flare class, CME, type II/III/IV, periodicity, etc.)].

Example:

EOVSA observed a series of weak, narrowband microwave bursts from AR 4246 during the decay phase of an M1.2 flare, showing a quasi-periodic pattern at high central frequencies. OVRO-LWA detected a concurrent moving type IV burst associated with a fast CME (~1600 km/s).

2. Key Elements to Include

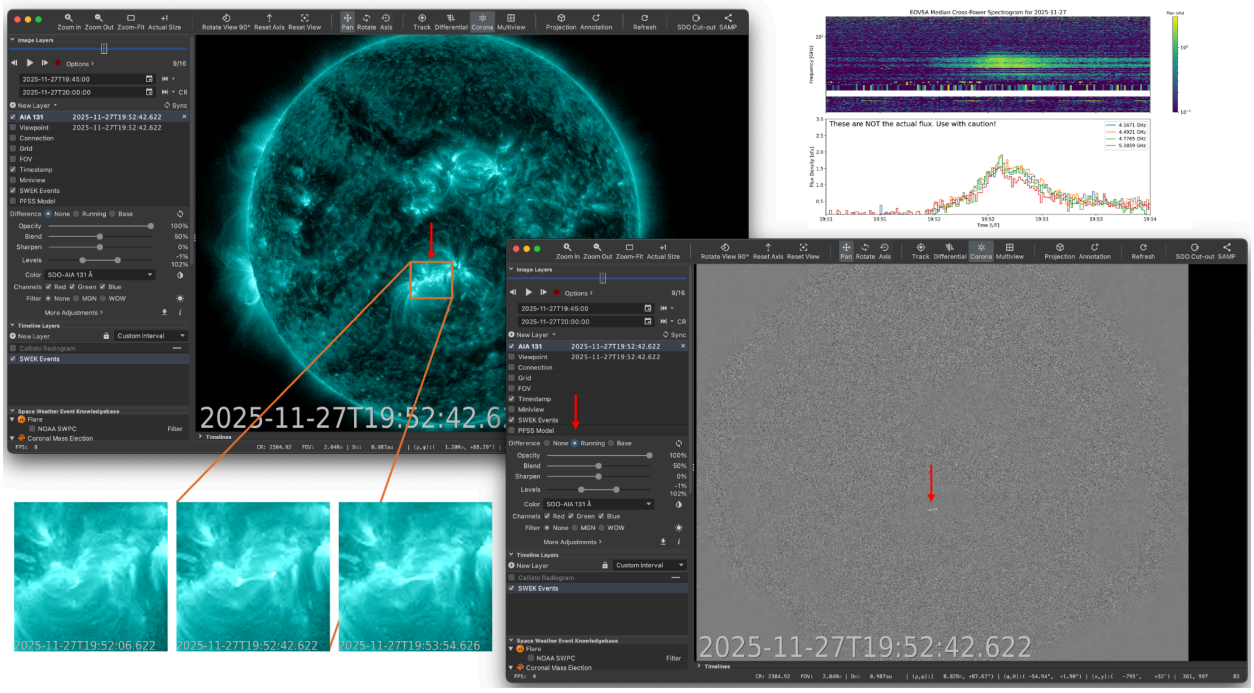
Category	What to Describe	Examples
Instrument(s)	Which telescope(s) detected the event	EOVSA, OVRO-LWA, or both
Type & Strength of Burst	Qualitative intensity (weak, bright, strong), spectral shape (narrowband, broadband)	“Weak narrowband burst,” “Bright broadband emission”
Frequency Characteristics	Central frequency, low-/high-frequency cutoff, or range	“High central frequency (~10–15 GHz), low-frequency cutoff at 3 GHz”
Temporal Features	Duration, periodicity, phase of flare	“Short-duration,” “Periodic pattern,” “During flare decay”
Source Region	Active region number, limb/on-disk, or associated feature	“From productive AR 4246,” “Near the west limb”

Associated Phenomena	Flare class, CME, or other radio types (II, III, IV)	“Associated with a fast CME and a type IV burst”
Notable Features / Remarks	Anything unusual or noteworthy	“No significant SXR flare recorded”

3. How to identify the location of a weak flare when it is not listed in LMSAL’s Latest Events

Use JHelioviewer. For weak flares, the source may not be obvious in standard EUV images, unlike major events. By enabling the running difference view (current frame minus a previous frame), you can highlight rapid brightness changes and pinpoint the flare location.

Below is an example using a narrow-band gyrosynchrotron flare at 19:52 UT on 2025 Nov 27. In the standard AIA 131 Å image, the flare source is barely visible. However, once the running difference option is enabled, the flare site becomes evident — it is the region showing the most significant temporal change on the Sun.



Instructions for Connecting to the SoD VNC Window on Helios

A dedicated SoD account has been created on helios:

Username: sod

Password: obs4me

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SSH Configuration (macOS/Linux)

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Add the following to your ~/.ssh/config file:

```
######################
Host ovsa
 HostName ovsa.njit.edu
 User <your-username-on-ovsa-and-pipeline>
 IdentityFile ~/.ssh/id_rsa
 UseKeychain yes
 ForwardAgent yes
 ForwardX11Trusted yes
 ForwardX11 yes
 XAuthLocation /opt/X11/bin/xauth

Host pipeline
 HostName pipeline.solar.pvt
 User <your-username-on-ovsa-and-pipeline>
 IdentityFile ~/.ssh/id_rsa
 UseKeychain yes
 ForwardAgent yes
 ForwardX11Trusted yes
 ForwardX11 yes
 ProxyJump ovsa
 XAuthLocation /opt/X11/bin/xauth

Host helios-sod
 HostName helios.solar.pvt
 User sod
 ForwardAgent yes
 ForwardX11Trusted yes
 ForwardX11 yes
```

```
 ProxyJump ovsa
 XAuthLocation /opt/X11/bin/xauth
######################
```

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SSH Configuration (Windows)
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On Windows, the SSH config file is usually located at:
C:\Users\<YourUsername>\.ssh\config

Add the following entries:

```
######################
Host ovsa
 HostName ovsa.njit.edu
 User <your-username-on-ovsa-and-pipeline>
 IdentityFile C:\Users\<YourUsername>\.ssh\id_rsa
 ForwardAgent yes
 ForwardX11Trusted yes
 ForwardX11 yes

Host pipeline
 HostName pipeline.solar.pvt
 User <your-username-on-ovsa-and-pipeline>
 IdentityFile C:\Users\<YourUsername>\.ssh\id_rsa
 ForwardAgent yes
 ForwardX11Trusted yes
 ForwardX11 yes
 ProxyJump ovsa

Host helios-sod
 HostName helios.solar.pvt
 User sod
 ForwardAgent yes
 ForwardX11Trusted yes
 ForwardX11 yes
 ProxyJump ovsa
```

######################

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Steps to connect

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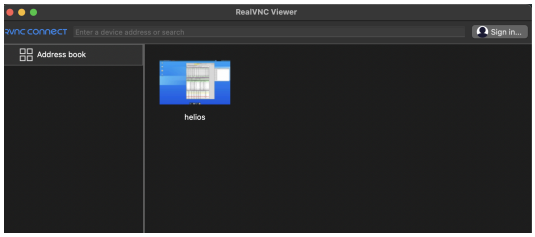
1. Establish an SSH tunnel

   On your local machine, run:

   `ssh -L 20001:localhost:20001 helios-sod`

   This forwards port 20001 from helios to your local computer.

2. Download realVNC (https://www.realvnc.com/en/connect/download/viewer/) → open the app (Do not create user account,use without logging in) → Files→ New Connection (add address- `localhost:20001`, `Password: obs4me`)



3. Connect with a VNC client

   Open your VNC client (e.g., RealVNC) and use:

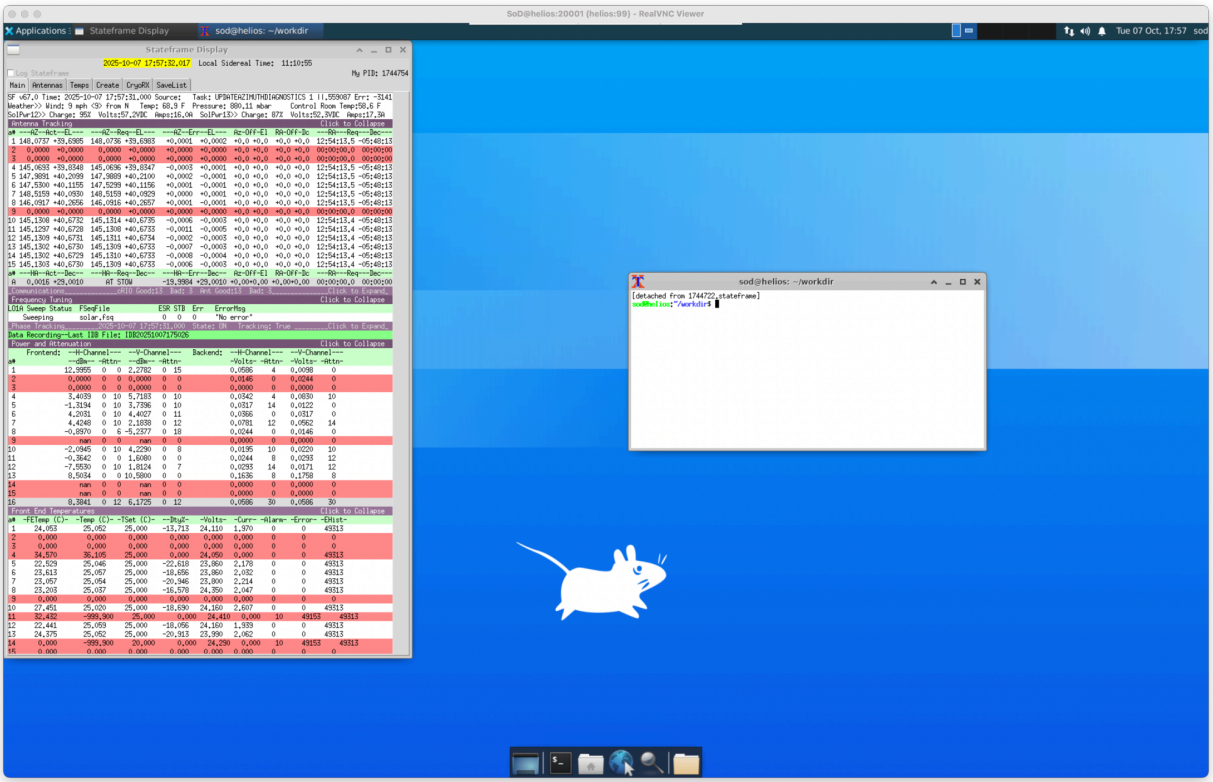
   `Host: localhost`

   `Port: 20001`

   `Password: obs4me`

3. Usage Notes

- You should see the stateframe GUI appear in the VNC window.



- Do not close the stateframe GUI after your SoD duty. Leave it open so the next SoD user can continue to use it.
- If the stateframe GUI becomes unresponsive or has been closed, refer to Owen's Notes – Restarting the Stateframe Display for SoDs for instructions on how to restart it.