

Coordination between PSP and Ground-Based Observatories

Summary of the PSP GBN Report

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The PSP - GBN Effort

- The role of the **Parker Solar Probe (PSP) Ground-Based Network (SPP-GBN)** is to optimize and enhance the science return of the PSP mission by providing unique data from the ground.
- The role of the GBN extends to planning and coordination, supported by appropriate infrastructure, to ensure that
 - the right kinds of observations are acquired
 - by the various facilities,
 - at the right times,
 - and that the data are readily accessible to the community for a variety of uses.
- The PSP-GBN addresses science questions that will help interpreting PSP data, but also provide global context and allow us to understand how PSP observations inform our understanding of solar phenomena.



The PSP - GBN White Paper

Available at

https://sppgway.jhuapl.edu/sites/default/files/Pubs/SPP-GBN-WhitePaper-v5.0.pdf



The Solar Probe Plus Ground Based Network

V4.0

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The PSP-GBN Science Objectives

1. How do the corona and inner heliosphere magnetically connect to the Sun?

- 1. What is the global context for in situ structures measured by SPP?
- 2. How do transient structures e.g., CMEs from the Sun affect the corona and inner heliosphere?

2. How are solar energetic particles accelerated and transported to SPP, SO, and other space missions?

- 1. What are the sources of energetic particle suprathermal seed populations?
- 2. What role do flares and CME-driven shocks play in the acceleration of solar energetic particles?

3. What generates wave and turbulence energy on and near the Sun?

- 1. How does solar wind turbulence evolve between the Sun and SPP?
- 2. What turbulence dissipation mechanism(s) is(are) operative in the corona and solar wind?



The Role Of GBN

Monitoring

 24/7 observations of solar conditions (transient activity, coronal hole evolution, etc.)

Forecasting

 Using the monitoring data to create forecast of the conditions on the Sun and inner heliosphere.

Modeling

 Useful for certain kinds of modeling. Will play a central role in realizing the PSP-GBN objectives.

Mission Planning

 GBN can provide 'situational awareness' for solar/heliospheric conditions that would be useful for the PSP science operations.



Coordination of the GBN: Issues

- There are two broad types of GBN support
 - Monitoring Observations: Used for modeling, forecasting, mission planning, and context. Minimum suite of observations and data products TBD.
 - Campaign Observations: Targeted observations to address PSP-GBN science objectives at critical phases of the mission (e.g perihelion). Could include a broader set of GB instruments than the core GBN.
- Many GBN facilities are national observatories serving broad communities.
 - Competitive proposal process for time allocation. It does not guarantee support when needed
 - May require launch of specific funding programs or MOUs for PSP/SO science.
- Data Formats, Standards, Archiving
 - How to make the data available (real-time?) and how to access them. Plenty of background work (VSO) exists. It's a matter of planning and coordination.
- Scheduling Support
 - Requires close coordination with PSP SWG and PSP-GBN. Mechanism is TBD



The PSP - GBN Path Forward

- Formalize the PSP—GBN relationship
 - List of facilities along with commitments to provide support. Possibly establish a 'user' committee.
 - Invite smaller observatories and international partners.
- Ensure availability of facilities and personnel
 - Establish specific an NSF funding program for GBN support to PSP.
 - MOUs between NASA and national facilities for time allocation for monitoring and campaign observations.
- Agree on a data distribution process
 - File formats, providers, etc.
- Scheduling-Coordination
 - Establish a mechanism for coordination between PSP SWG and GBN participants (e.g. attend SWG, disseminate PSP observing schedules, etc.)



