SSSC Roadmap Targeted Outcome F 2 C

Targeted Outcome: Phase 2015-2025, Opening the Frontier
Quantifying Coupling Mechanisms at Critical Interfaces

Required Understanding

- Transfer of solar wind information through global current systems
- Feedback of the ionosphere on magnetospheric electrodynamics
- Controllers of mass and energy flow between the solar wind and geospace
- Detailed coupling of magnetotail dynamics to the polar region
- Chemical & dynamical coupling between ITM disturbances & the lower atmosphere
- Transition of solar eruptive events from release to propagation

Enabling Capabilities & Measurements

- Global characterization of the current systems linking geospace using swarms of satellites
- Global scale neutral winds, ionospheric densities & drifts
- Multi-point measurements of solar wind and dayside magnetopause
- Satellite observations of atmospheric chemistry & key dynamical features
- Simultaneous multi-point characterization of the magnetotail and imaging of the auroral oval
- Simultaneous measurement of solar reconnection features and heliospheric density structures
- Two-way-coupled modeling capabilities

Implementation Phase 2: 2015-2025

MMS, ITSP, RBSP, SDO, STEREO
The existing Great Observatory provides necessary measurements to understand the linkages

ITM-Waves, GEC, MC, Sentinels
These are the most important missions in this phase to address coupling mechanisms at interfaces

Solar Probe, SEPP, MTRAP, DBC, GEMINI, AAMP
These are missions that also could provide critical measurements for understanding linkages between regions

Theory/Modeling
Coupled models between regions of space to provide physical insight on mass and energy transfer rates