



Integrated Science Investigation of the Sun (IS \odot IS): Overview and Initial Results

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The Parker Solar Probe (PSP) mission's Integrated Science Investigation of the Sun (IS \odot IS) comprises a two-instrument suite to measure energetic particles over a very broad energy range, as well as coordinated management, science operations, data processing, and scientific analysis. IS \odot IS explores the mechanisms of energetic particles dynamics, including their 1) Origins— defining the seed populations and physical conditions necessary for energetic particle acceleration; 2) Acceleration—determining the roles of shocks, reconnection, waves, and turbulence in accelerating energetic particles; and 3) Transport—revealing how energetic particles propagate from the corona out into the heliosphere. The two IS \odot IS Energetic Particle Instruments measure lower (EPI-Lo) and higher (EPI-Hi) energy particles. EPI-Lo measures ions and ion composition from ~ 20 keV/nucleon up to ~ 15 MeV total energy and electrons from $\sim 25 - 1000$ keV. EPI-Hi measures ions from $\sim 1 - 200$ MeV/nucleon and electrons from $\sim 0.5 - 6$ MeV. EPI-Lo comprises 80 tiny apertures with fields-of-view (FOVs) that sample over nearly a complete hemisphere, while EPI-Hi combines three telescopes that together provide five large-FOV apertures. The IS \odot IS Science Operations Center plans and executes commanding, receives and analyzes all IS \odot IS data, and helps coordinate science observations and analyses with the rest of the PSP science investigations. Together, IS \odot IS' unique observations on PSP will enable the discovery, untangling, and understanding of the important physical processes that govern energetic particles in the innermost regions of our heliosphere, for the first time. This talk summarizes the investigation and provides a first look at early IS \odot IS data from space to the extent that it is available at the time of the EGU meeting.