



Contribution ID: 45

Type: **Tutorial lecture**

Understanding solar wind acceleration: Solar Probe Plus.

Tuesday, 29 November 2011 17:00 (45 minutes)

The magnetic field is fundamental to solar activity and shapes the interplanetary environment, as clearly shown by the full three dimensional monitoring of the heliosphere provided by the measurements of the Helios, Ulysses, SOHO, ACE, Wind, STEREO and Voyager spacecraft. Magnetic fields are also the source for coronal heating and the very existence of the solar wind; produced by the sun's dynamo and emerging into the corona magnetic fields become a conduit for waves, act to store energy, and then propel plasma into the heliosphere in the form of Coronal Mass Ejections (CMEs). Transformation of magnetic energy is also the source solar energetic particle events.

The way in which solar convective energy couples to magnetic fields to produce the multifaceted heliosphere is at the heart of Solar Probe Plus (SPP) exploration. This contribution highlights the exciting perspectives for discovery provided by the first direct exploration of the solar corona. Tests of current theoretical models of coronal heating and wind acceleration will be described and focus areas for further numerical and theoretical efforts illustrated in the light of the SPP observations.

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Session Classification: Satellite Meeting