SHINE 2006

Student Day
Working Group III summary

Zermatt, Utah, July 31 - August 4

Gang Li

Topics

- **Origin and Evolution of Suprathermal Ion Populations in the Solar Corona and the Interplanetary Medium**

Leaders: Mihir Desai/ J. Raymond

- **Where can CME shocks form in the solar corona?**

Leaders: Simon Plunkett/Mihir Desai

- **Turbulence**

Leaders: Randy Jokipii/Joe Giacalone

- **Shock geometry and particle injection at shocks.**

Leaders: G. Li/C. Cohen

- **Particle spectrum and upstream (downstream) phenomena**

Leaders: G. Li/I. Roussev

- **The Historic Solar Event of January 20, 2005: A Challenge for Current Theories on the Origins of Solar Energetic Particles?**

Leaders: Allan Tylka/M I. Desai

- **CIRs and Energetic Particles**

Leaders: M. I. Desai/I. Roussev/I. G. Richardson

Theory and Modeling:

Acceleration:

role of turbulence

seed population

compositional characteristics

Propagation:

turbulence and pitch angle scattering

Probing solar wind turbulence

Difference between e- and ions

Energetic Particles

Observations:

Remote sensing: RHESSI, SOHO/UVCS, SOHO/LASCO, GOES, Nancy

In-situ: ACE, WIND, IMP8, GOES, etc.

Event variability, Smoking gun event.

Origin and Evolution of Suprathermal Ion Populations in the Solar Corona and the Interplanetary Medium

- Seed population
- Injection problem
- UVCS observation
- ACE/WIND observation

John Kohl/John Raymond:
SoHO/UVCS observations of suprathermal ions in the solar corona (15 minutes)
Thomas Zurbuchen:
ACE/SWICS observations of suprathermal ions near 1 AU (5 minutes)
Mihir Desai:
ACE/ULEIS and Wind/STEP observations of suprathermal ion composition over a solar cycle (5 minutes)
Len Fisk:
Production of Suprathermal Ions near the Sun (5 minutes)
Nathan Schwadron:
Origin and Evolution of Suprathermal Ions near the Sun and in the interplanetary medium (5 minutes)

Where can CME shocks form in the solar corona?

Acceleration site and time scale

Timing study from electrons, ions and X-ray, radio, etc.

A. Tylka:
Timing study of energetic particles, ions and electrons (5 minutes)
A. Vourlidas:
Coronagraph observations of CME shocks (15 minutes)
Gopalswamy/Cane:
What can we learn from radio obserations? (5 minutes)
Sam Krucker:
X-ray and gamma-ray observations and discuss their possible implications for shock formation (15 minutes)

Turbulence

Generation and evolution of turbulence

Property of turbulence

Characterize quiet solar wind turbulence at 1AU

Inferring near-Sun turbulence property using radio scintillation

Randy Jokipii:
Turbulent diffusion at the Sun and its effects on the magnetic field.
Chuck Smith:
Observations of turbulence near the dissipation range in frequency.
Joe Mazur:
Observations of dropouts.
Steve Spangler:
Observations of density fluctuations near the Sun using radio scintillation
Aaron Roberts
MHD simulations of turbulence
Miriam Forman:
Theory of Magnetic-Field Turbulence and Intermittency
Ben Chandran:
MHD turbulence in the corona

Shock geometry and particle injection at shocks

Injection mechanism and its dependence on shock geometry

Achieving higher energy at a perp. shock?

Compositional differences among large SEP events as indicator for shock geometry

G. P. Zank:
Particle acceleration at a perpendicular shock (15 minutes)
J. Giacalone:
Electron acceleration at shocks (15 minutes)
A.Tylka:
Perp. shock to explain various Fe/O ratios
G. Ho:
Particle injection and acceleration in ESP events
Dietmar Krauss-Varban:
Electron acceleration at shocks
Nathan Schwadron:
Shock geometry and injection: insights from recent TS results

Particle spectrum and upstream (downstream) phenomena

Role of turbulence in particle acceleration

Ordering spectral breaks by (Q/M)

Spectral observations of large SEP events

Wave spectra up and downstream

C. Cohen:
Particle spectra in large SEP events
G. Li:
What can we learn about the upstream wave power from particle spectra?

M. Lee:
Turbulence generation at interplanetary shocks
Lario/G. Ho

C. Smith/ Qiang Hu:
Upstream and downstream magnetic field of interplanetary shocks

The Historic Solar Event of January 20, 2005: A Challenge for Current Theories on the Origins of Solar Energetic Particles?

Smoking gun event:

acceleration time scale

Pre-eruption condition

Pete Riley:
On the condition of the corona at launch of this event.
Gerry Share:
On modeling and interpretation of the RHESSI observations.
Gary Zank:
On characteristics required in order for a shock to account for this event.
Joe Giacalone:
Differences between acceleration at a quasi-parallel and a quasi-perpendicular shock.

CIRs and Energetic Particles

Shock acceleration and transport in 1 – 5 AU

Compositional signature

ACE and Ulysses observation

J. E. Mazur:
Ion composition in CIRs at 1 AU
I. Richardson:
CIR energetic particles in and out of the ecliptic
J. Giacalone or J. R. Jokipii:
Particle acceleration and transport in CIRs
Lennard Fisk:
Implications of non-Parker IMF for CIR energetic particle transport at high latitudes