

The Solar-B Mission and the Forefront of Solar Physics

The Fifth Solar-B Science Meeting

— Dedicated to the Memory of Yutaka Uchida —

November 12–14, 2003

The International House, Roppongi, Tokyo

Solar-B, the successor of Yohkoh (Solar-A) mission, is being developed at ISAS and NAO, Japan, in cooperation with NASA, PPARC and ESA. The main instruments are a 50cm-diameter optical telescope (SOT) with a focal plane package (FPP), a grazing-incidence soft X-ray telescope (XRT), and an EUV imaging spectrometer (EIS). The launch is planned to be 2006 summer. This meeting is the 5th in the series of Solar-B science meetings. It commemorates Yutaka Uchida who passed away last August, and we honor the role he played in making the Solar-B project a reality. This meeting emphasizes basic scientific topics rather than instrumentation, and participation from the entire solar community has been strongly encouraged.

Scientific Organizing Committee:

T. Sakurai (NAOJ, Chair), L.W. Acton (Montana State U.), J.L. Culhane (MSSL), L. Golub (SAO), V. Hansteen (U. Oslo), H.S. Hudson (U.C. Berkeley), K. Kosugi (ISAS/JAXA), K. Shibasaki (NAOJ), K. Shibata (Kyoto U.), A.M. Title (LMATC), S. Tsuneta (NAOJ), T. Watanabe (NAOJ)

Local Organizing Committee:

T. Sekii (NAOJ, Chair), E. Hiei (NAOJ), M. Kubo (U. Tokyo), J. Kuwabara (NAOJ/Sokendai), Y. Sakamoto (U. Tokyo), T. Sakurai (NAOJ), T. Shimizu (NAOJ)

Program

***** November 12 (Wed) *****

Registration, Coffee	09:00 – 09:30
Welcome Message from SOC/LOC	09:30 – 09:40
Session Ia.	(Chairperson: T. Kosugi) 09:40 – 11:30
Topic: Solar-B Mission	
T. Kosugi	10+5 min
Mission Overview	
Toshifumi Shimizu	30+10 min
Optical Telescope and Focal Plane Package (SOT)	

R. Kano and M. Shimojo X-ray Telescope (XRT)	20+5 min
H. Hara EUV Imaging Spectrometer (EIS)	20+5 min
Lunch Break	11:30 – 13:30
Session Ib.	(Chairperson: A. Title) 13:30 – 15:30
Topic: Convection and Subsurface Magnetic Fields	
M. Dikpati Dynamo Models	30+10 min
Y. Fan Dynamics of Emerging Flux Tubes	30+10 min
A. Kosovichev Helioseismology for Solar-B and Joint Investigations with SDO/HMI Project	30+10 min
Coffee	15:30 – 16:00
Session Ic.	(Chairperson: J. Wang) 16:00 – 18:00
Topic: Convection and Subsurface Magnetic Fields (Cont.)	
T. Sekii SOT Local-Helioseismology Programme	20+5 min
Topic: Surface Manifestation of Magnetic Fields	
T. Berger Recent Progress in High Resolution Observations	30+10 min
S.K. Solanki and M. Schüssler Small Scale Solar Magnetic Fields	30+10 min
***** November 13 (Thu) *****	
Coffee, Poster Setup	09:00 – 09:30
Session IIa.	(Chairperson: S. Tsuneta) 09:30 – 11:30
Topic: Surface Manifestation of Magnetic Fields (Cont.)	
J. Sanchez-Almeida The Magnetism of the Very Quiet Sun	30+10 min
J. Wang A Weak Component of Solar Magnetism	10+5 min
Topic: Magnetohydrodynamics of the Solar Atmosphere	
Å. Nordlund Magnetohydrodynamics of the Solar Atmosphere	30+10 min

K. Shibasaki	10+5 min
A Pumping-Up Mechanism of Mass and Energy from the Photosphere into the Upper Atmosphere	
Lunch Break	11:30 – 13:30
Session IIb.	(Chairperson: G. Vekstein) 13:30 – 15:00
Topic: Magnetohydrodynamics of the Solar Atmosphere (Cont.)	
K. Kusano	30+10 min
Study of Magnetic Helicity in the Solar Corona	
T. Magara	10+5 min
Injection of Magnetic Energy and Magnetic Helicity into the Solar Atmosphere by an Emerging Magnetic Flux Tube	
D. Melrose	10+5 min
Conservation of Both Current and Helicity in Solar Flares	
H. Aurass	10+5 min
Observing the Reconnection Outflow Termination Shock during Solar Flares	
Coffee, Poster Viewing	15:00 – 16:30
Session IIc.	(Chairperson: G. Doschek) 16:30 – 18:00
Topic: Coronal Structures	
J.L. Culhane	30+10 min
X-ray and EUV Observations of Large-Scale Coronal Structures	
L. Golub	10+5 min
XRT DEM Diagnostics	
Tetsuya Watanabe	10+5 min
Electron Densities of High-Temperature Coronal Loops	
J. Singh, T. Sakurai, and K. Ichimoto	10+5 min
Spectroscopic Study of Steady Coronal Structures	
Banquet	18:30 – 20:30
***** November 14 (Fri) *****	
Coffee, Poster Viewing	09:00 – 10:00
Session IIIa.	(Chairperson: Tetsuya Watanabe) 10:00 – 11:35
Topic: Heating of the Atmosphere	
M. Carlsson	30+10 min
Chromospheric Heating and Dynamics	
V.M. Nakariakov	30+10 min
Coronal Waves: Coronal Heating and Coronal Seismology	
T. Suzuki	10+5 min
Coronal Heating and Acceleration of the Fast/Slow Solar Wind by Fast/Slow MHD Waves	

Lunch Break 11:35 – 13:30
(Posters must be removed by 13:30.)

Session IIIb. (Chairperson: V. Hansteen) 13:30 – 15:30

Topic: Heating of the Atmosphere (Cont.)

G. Vekstein, Y. Katsukawa, and S. Tsuneta 20+5 min
Nanoflare Heating of the Corona

Y. Katsukawa and S. Tsuneta 10+5 min
Properties of Photospheric Magnetic Fields at Footpoints of Hot and Cool Loops

R. Moore, D. Falconer, J. Porter, D. Hathaway, and Y. Yamauchi 10+5 min
Coronal Heating, Spicules, and Solar-B

S. Tsuneta and Y. Katsukawa 10+5 min
Coronal Heating with Sweet-Parker Pico-Flares

Topic: Large-Scale Coronal Dynamics

P.T. Gallagher 30+10 min
Large-Scale Coronal Dynamics

Coffee 15:30 – 16:00

Session IIIc. (Chairperson: L. Golub) 16:00 – 17:40

Topic: Large-Scale Coronal Dynamics (Cont.)

K. Shibata 30+10 min
MHD Shock Waves in the Corona

A. Zhukov 20+5 min
Large-Scale Coronal Dynamics Observed by SOHO/EIT

N. Narukage 10+5 min
Observations of Flare-Associated Waves with Solar-B

T. Sakurai: Meeting Summary 15 min

Poster Papers

- P1 R. Cameron, A. Vögler, S. Shelyag, and M. Schüssler
The Decay of a Simulated Pore
- P2 H. Isobe
Three-Dimensional MHD Simulation of Convection and Emerging Flux
- P3 T. Miyagoshi, H. Isobe, T. Yokoyama, and K. Shibata
Jet Phenomena in the Solar Atmosphere Caused by Interaction between Emerging Flux and Pre-Existing Coronal Magnetic Fields
- P4 M.S. Wheatland
Nonlinear Force-Free Magnetic Field Configurations
- P5 Debi Prasad Choudhary, K.S. Balasubramaniam, and Y. Suematsu
Asymmetric Stokes-V Profiles at the Penumbra Boundary of a Sunspot
- P6 B.W. Lites, G.B. Scharmer, T.E. Berger, and A.M. Title
Three-Dimensional Structure of the Active Region Photosphere as Revealed by High Angular Resolution
- P7 M. Kubo and Toshifumi Shimizu
Vector Magnetic Field of Moving Magnetic Features around a Well-Developed Sunspot
- P8 B.J. LaBonte, M. Georgoulis, and D.M. Rust
Measuring Magnetic Helicity Transport in Solar Active Regions: The Need for Vector Magnetic Fields
- P9 T. Yamamoto, T. Sakurai, K. Kusano, and T. Yokoyama
Magnetic Helicity Injection and Sigmoidal Coronal Loops
- P10 Y. Sakamoto
Magnetic Helicity, Magnetic Energy, and EUV Variability
- P11 M. Hagino, T. Sakurai, and A. Miyazawa
Phase Relationship between the Activity Cycles of Sunspots and Polar Faculae
- P12 A. Satya Narayanan, R. Ramesh, C. Kathiravan, and E. Ebenezer
Kink Oscillations in the Solar Corona
- P13 Y. Yamauchi, R.L. Moore, S.T. Suess, H. Wang, and T. Sakurai
Macropicules, Coronal Heating, and Solar-B
- P14 H. Hara and K. Nakakubo
Variation of the X-ray Bright Point Number over the Solar Activity Cycle
- P15 S. Akiyama, G.A. Doschek, and J.T. Mariska
The Relationship between Nonthermal Velocities in Different Temperature Regions of the Solar Lower Transition Region
- P16 M. Shimojo
Derivation of DEM Distribution Using YOHKOH/Soft X-ray Telescope
- P17 S. UeNo, S. Nagata, R. Kitai, and H. Kurokawa
The Features of Solar Telescopes at the Hida Observatory, and the Possibilities of Coordinated Observations with Solar-B

- P18 S. Nagata and SMART Team
Coordinated Observation by Solar-B and Solar Magnetic Activity Research Telescope (SMART) for Probing the Coronal Loop Heating Mechanism
- P19 T.T. Ishii, S. Nagata, S. Ueno, R. Kitai, and H. Kurokawa with SMART Team
Studies on the Flare Energy Build-up Process Using Solar-B/Solar Optical Telescope (SOT) and Solar Magnetic Activity Research Telescope (SMART) at Hida Observatory
- P20 S. Masuda
Coronal Hard X-ray Source Accompanying a Plasma Ejection
- P21 J. Sato
Statistical Study of Hard X-ray Footpoint Region Observed with YOHKOH
- P22 C.P. Goff, S.A. Matthews, and L.K. Harra
Relating Magnetic Field Strengths to Hard X-ray Emission in Solar Flares
- P23 Y. Hanaoka
 $H\alpha$ Impact Polarization Observed in a Gradual Flare
- P24 K. Kobayashi, S. Tsuneta, T. Tamura, K. Kumagai, Y. Katsukawa, M. Kubo, Y. Sakamoto, N. Kohara, T. Yamagami, Y. Saito, K. Mori, and G. Kato
Hard X-ray Spectral Observation of a High-Temperature Thermal Flare
- P25 Y. Litvinenko
Particle Acceleration Associated with Three-Dimensional Fan Magnetic Reconnection
- P26 Tohru Shimizu
Slow Shock Formation and Plasmoid Structure in Fast Magnetic Reconnection
- P27 T. Yokoyama
MHD Simulations of Magnetic Reconnection with Finite-Amplitude Fluctuations
- P28 A. Asai
Downflow as a Reconnection Outflow
- P29 D.H. Brooks
Spectroscopic Detection of Magnetic Reconnection Evidence in the Solar Atmosphere with Solar-B/EIS
- P30 D. Shiota, H. Isobe, D.H. Brooks, P.F. Chen, and K. Shibata
XRT and EIS Observations of Evidence of Magnetic Reconnection
- P31 A.C. Sterling
Tether-Cutting Energetics of a Quiet Region Prominence Eruption
- P32 S. Yashiro, N. Gopalswamy, E.W. Cliver, D.V. Reames, M.L. Kaiser, and R.A. Howard
Association of Coronal Mass Ejections and Metric Type II Radio Bursts with Impulsive Solar Energetic Particle Events
- P33 G. Attrill, L.K. Harra, S.A. Matthews, C.A. Foley, and A.C. Sterling
The Relationship between Prominence Eruptions and Global Coronal Waves
- P34 K. Hori, K. Ichimoto, T. Sakurai, Y. Nishino, and NOGIS Team
Flare-Induced Coronal Disturbances Observed with Norikura ‘NOGIS’ Coronagraph: A CME Onset
- P35 I. Suzuki and Y. Uchida
Observation of Two Different Types of CMEs

- P36 J. Kuwabara and Y. Uchida
Investigation of Loop-Type CMEs with 3D MHD Simulations
- P37 Takashi Watanabe, Y. Namiki, H. Adachi, K. Marubashi, and S. Watari
Interplanetary Flux Ropes and their Coronal Counterparts
- P38 W. Unno, M. Yuasa, and H. Shibahashi
Precipitation Diffusion Model of Solar Wind for Sky Brightness Variation