Session:	**[B3C-1] S1 : Solar System and Sun-Earth Interactions**
Date:	August 20, 2014 (Wednesday)
Time:	16:00~17:30
Room:	Room A (Room 101~102)
Chair:	David Ruffolo (Mahidol University)

[B3C-1-1] **16:00~16:15**

Probing the Energy Build-Up and Trigger Mechanism of a X1.2 Class Solar Flare on May 15, 2013

Aabha Monga (Aryabhatta Research Institute of Observational Sciences (ARIES), India), Arun Awasthi, Wahab Uddin, and Ramesh Chandra

In this paper, we study the energy build-up and trigger processes responsible for a X1.2 class solar flare that occurred in NOAA AR 11748, having magnetic complexity βγδ on May 15, 2013. The flare was well observed by ground based (Hα ARIES, Nainital) and space borne(SDO, STEREO). The flare shows two ribbons structures. Morphology of flare ribbons shows that the brightening propagates along the southern ribbon. We have noticed several H-alpha kernels that shows different spatially and temporally evolutionary behavior. On the contrary, we do not find filament associated with this event. Therefore, to explore the driver of instability leading to this highly energetic flare, we study the morphological evolution of the active region SDO and STEREO data. We also study the evolution of photospheric magnetic field parameters from SDO/HMI magnetograms in conjunction to the E/UV emission. From AIA EUV images, we note sets of coronal loops over the active region, which show upward motion with the time. We explicitly note mass ejection and disruption of coronal loops. We make a height-time study of the loop eruption in order to understand the acceleration mechanism. From this study, we infer that this flare onset site was beneath the uprising coronal loops. A CME is also associated with this flare as observed from LASCO and STEREO images.

[B3C-1-2] **16:15~16:30**

Acceleration of Solar Energetic Particles during Decline Phase of SC-23

Ahmed A. Hady (Cairo University, Egypt)

The solar energetic particles (SEP's) could be accelerated to higher energies of order of MeV per nucleon. A modified model for SEP's acceleration has been given and applied for storms event during the decline phase of solar cycle 23. The estimated values of the solar magnetic field during the solar particle event were introduced. The solar magnetic field describes a sophisticated feature of discrete sectors/regions over the period that starts from 28 October 2003 to 4 November 2003. The applications of the suggested model on the solar particle event show that a homogeneous structure is in agreement with the observations. The acceleration time is calculated, where the energy losses due to the different physical processes are entirely neglected. The combination of the direct acceleration and the well-known Fermi mechanisms verifies the observed spectrum.

[B3C-1-3] **16:30~16:45**

Classification of SPEs According to Their Origins and Acceleration Trends Using the Multi-Channel Observation

R.-S. Kim (Korea Astronomy and Space Science Institute, Korea), K.-S. Cho, S.-C. Bong, and Y.-D. Park

To investigate characteristics of the solar proton event (SPE) and its association with other solar eruptive phenomena, we examined 42 SPEs observed from 1997 to 2012, which have clear information of associated flares, coronal mass ejections (CMEs) and interplanetary (IP) type II radio bursts. By applying the velocity dispersion analysis to the proton flux observations in the multi-energy channels from 13 to 130 MeV detected

by SOHO/ERNE, we estimated the onset times of proton flux increase at the solar vicinity on the respective energy levels, and compared it with the onset times of flares and type II radio bursts, and the first appearance times of CMEs in the LASCO field of view. The results are as follows: (i) among 42 SPEs, 13 events (31%) start to accelerate during the are X-ray intensity is increasing, and for the other 29 SPEs (69%), the onset times well agree with the first appearance time of CMEs; (ii) there are different trends of the onset sequence between the are associated events and CME associated events. The former show the accelerations starting from the lower energetic pro- tons, while the latter show the accelerations from the either energy ranges, starting from the higher (13 events, 31%) or the lower (9 events, 21%), and sometimes simultaneous accelerations for all energy ranges within 10 minutes (7 events, 17%); and (iii) the are associated SPEs tend to have large flux enhancements in a short time, while the CME associated SPEs tend to have relatively weak and slow flux enhancements. Although we classified the SPEs by the onset sequences and the acceleration trends based on the velocity dispersion analysis, our results well consistent with the conventional classification based on the profile of proton flux, such as impulsive and gradual SPEs.

[B3C-1-4] **16:45~17:00**

3D Simulation of Galactic Protons and Electrons Modulation for Fisk-Parker Hybrid Heliospheric Magnetic Field Pattern

Zbigniew Kobylinski (Polish Air Force Academy, Poland), Ali Ajabshirizadeh, and Tengiz Botchorishvili

The structure of heliospheric magnetic field (HMF) is discussed till nowadays and remains an unsolved problem. Parker spiral pattern was confirmed by measurements in the heliospheric equatorial plane. The measurements of the Ulysses spacecraft at high latitudes exhibit that this model would be improved especially for the period of solar minimum. The way to understand Ulysses results led to the development of HMF Fisk pattern. In this study papers published up to the present on this subject are reviewed.
A steady state 3D transport equation with drift included is solved in the spherically symmetric heliosphere bounded at the distance of 80 AU in order to compare the modulation of galactic protons and electrons in standard Parker spiral pattern and in simplified Fisk's field with latitude-dependent solar wind i.e. Schwadron-Parker hybrid field In calculations the parallel and perpendicular diffusion coefficients are proportional to 1/B, anti-symmetric element of the diffusion tensor has the form derived by Forman et al. under the assumption of week-scattering.. We assume also that the two circular coronal holes are localized near the poles with the central points that are offset from the rotation axis by the angle 100.The computed spectra and gradients are presented. The results for Fisk's type IHF are consistent, in principle, with measurements at high latitudes.

Poster Session **17:00~17:30**

Chairs: **David Ruffolo** (Mahidol University)

Kyungsuk Cho (Korea Astronomy and Space Science Institute)