[포 IM-06] Spitzer and Herschel observations of protostellar outflows in L1251B

Yunhee Choi[1], Jeong-Eun Lee[1], Joel D. Green[2], Sébastien Maret[3], Yau-Lun Yang[4], Edwin A. Bergin[5], Geoffrey A. Blake[6], Abraham. C. A. Boogert[7], James Di Francesco[8,9], Neal J. Evans II[4], Klaus M. Pontoppidan[2], and Annelia I. Sargent[6]
[1]Kyung Hee University, Korea, [2]Space Telescope Science Institute, USA, [3]Institut de Planétologie et d'Astrophysique de Grenoble, France, [4]University of Texas at Austin, USA, [5]University of Michigan, USA, [6]California Institute of Technology, USA, [7]NASA Ames Research Center, USA, [8]National Research Council, Canada, [9]University of Victoria, Canada

L1251B is an excellent example of a small group of pre- and protostellar objects in low-mass star-forming region. Previous interferometer data with a high angular resolution resolved the outflows associated with L1251B into a few components. To understand the physical conditions of the protostellar outflows in L1251B, we mapped this region spectroscopically with Spitzer/IRS and obtained spectral line data from Herschel/PACS. Spitzer/IRS provides the S(0)-S(7) pure rotational lines of H2 as well as fine-structure emissions produced in shocks such as S, [Si II], and [Fe II] and it is a powerful tool for studying shocked interstellar gas. In addition, [O I] lines observed with Herschel/PACS are described well by J-type shock models expected in the outflows from protostars. We will present an analysis of the L1251B protostellar outflow in the H2 pure rotational lines and fine-structure emissions.

[포 IM-07] Polarized Infrared Emission from Polycyclic Aromatic Hydrocarbons and Implications

Thiem Hoang
Korea Astronomy and Space Science Institute & Korea University of Science and Technology

Polarized mid-infrared emission from polycyclic aromatic hydrocarbons (PAHs) can provide a crucial test of basic physics of alignment of nanoparticles and opens a potential new window into studying magnetic fields. In this talk, I will present a new model of polarized PAH emission that takes into account the effect of PAH alignment with the magnetic field due to resonance paramagnetic relaxation. I will then present our predictions for the polarization level of the strong PAH emission features from the interstellar medium. I will present the first detection of polarization of PAH emission at 11.3micron which is consistent with our theoretical prediction. Finally, I will discuss important implications of this work for tracing magnetic fields via mid-IR PAH features and for constraining the polarization of anomalous microwave emission that is useful for the quest of CMB B-modes.

태양/태양계

[포 SS-01] Connection between a Small-Scale Emerging Island and Double Arc Loops Producing a M6.5 Flare in Active Region 12371

Jihye Kang[1], Satoshi Inoue[2], Yong-Jae Moon[3], Tetsuya Magara[3] and Kanya Kusano[2]
[1]Department of Astronomy and Space Science, Kyung Hee University, [2]Institute for Space-Earth Environmental Research, Nagoya University, [3]School of Space Research, Kyung Hee University

In this paper, we report a small-scale emerging island and double arc loops, which are associated with a M6.5 flare, in Active Region 12371. We investigate the spatial and temporal changes of both photospheric magnetic fields using SDO/HMI data and coronal magnetic structures obtained from nonliner force-free field (NLFFF) extrapolation. From the vector magnetograms, we find a small-scale emerging island near the main polarityy inversion line about three hours before the flare. The island has a strong shear angle, which is determined by difference between transverse component of observed field and potential field, of around 90 degrees. Furthermore, the NLFFF well reproduces a sigmoidal structure seen in SDO/AIA 94, which is consistent with the double arc loops configuration suggested by Ishiguro and Kusano (2017) who introduced a magnetic configuration showing the double arc instability. The observed emerging island is located among the double arc loops, which is also supproted by their model. Finally, there was an eruption (M6.5 flare) associated with the loops. We discuss a possible role of the double arc instability for the eruption.

[포 SS-02] Velocity Oscillations in the