that can account for the observed characteristics of the lunar coma and tail simultaneously. Recently, the initial abundances of atomic species near surface are found to be different depending on certain local areas. We will present the influence of different initial conditions of localized sources on the characteristics of the lunar exosphere, and also present time-dependent simulations showing the distributions of atomic species around the lunar coma and the final stage of the lunar tail. Based on our updated 3-D lunar model, we will present resulted physical parameters of the lunar sodium coma and tail.

[포 SS-02] The inference of minimum temperature of the solar atmosphere from the FISS data

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In the solar atmosphere, below the region of temperature minimum, temperature decreases with height and above it, temperature increases with height. Therefore the inference of temperature minimum is a basis of the study about the solar atmosphere and heating problem. The temperature of the temperature minimum region can be inferred from acoustic cutoff frequency. According to a recent study the acoustic cutoff frequency is related to the peak frequency of the power spectrum the chromospheric three-minute velocity oscillations. Using this relationship, we infer the temperature of temperature minimum. The three minute velocity oscillation and its power spectrum are obtained for a pore observed with the Fast Imaging Solar Spectrograph (FISS) Hα band. We present the inferred temperature and compare it with the temperature of Maltby model. We also investigate the effect of the inclination of magnetic field on the temperature minimum.

[포 SS-03] The Limit of Magnetic Helicity Estimation by a Footpoint Tracking Method during a Flux Emergence

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Theoretically, the magnetic helicity transport flux through the solar surface into the upper atmosphere can be estimated indefinitely precisely by magnetic field footpoint tracking if the observational resolution is infinitely fine, even with magnetic flux emergence or submergence. In reality, the temporal and spatial resolutions of observations are limited. When magnetic flux emerging or submerging, the footpoint velocity goes to infinity and the normal magnetic field vanishes at the polarity inversion line. A finite observational resolution thus generates a blackout area in helicity flux estimation near the polarity inversion line. It is questioned how much magnetic helicity is underestimated with a footpoint tracking method due to the absence of information in the blackout area.

We adopt the analytical models of Gold-Hoyle and Lundquist force-free flux ropes and let them emerging from below the solar surface. The observation and the helicity integration can start at different emerging stages of the flux rope, i.e., the photospheric plane initially cuts the flux rope at different levels. We calculate the magnetic helicity of the flux rope below the photospheric level, which is eventually to emerge, except the helicity hidden in the region to be swept by the blackout area with different widths.

Our calculation suggests that the error in the integrated helicity flux estimate is about half of the real value or even larger when small scale magnetic structures emerge into the solar atmosphere.

[포 SS-04] Velocity oscillations in the Chromosphere above a Solar Quiet Region

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We investigate velocity oscillations in a solar quiet region by using the spectral data of the Hα and Ca II 8542Å lines. The data were acquired by the Fast Imaging Solar Spectrograph installed at the 1.6 m Goode Solar Telescope of Big Bear Solar Observatory. According to Chae & Litvinenko (2018)'s theoretical work, there is a correlation between dominant period of the oscillations and the temperature of the temperature minimum region in a non-isothermal atmosphere. In our study, we measure the temporal variations of the intensity and the line of sight Doppler velocity, and find out the relations between the intensity and