reconnection. In this reconnection process, the plasma in the loop system is redistributed in such a way that a smaller potential energy of the system is attained. We have performed numerical MHD simulations to investigate the plasma redistribution in coalescence of many small flux ropes. Our results clearly show that the redistributed plasma is more accumulated between flux ropes rather than near the magnetic axes of flux ropes. The Joule heating, however, creates a different temperature distribution than the density distribution. Our study may give a hint of which part of magnetic field we are looking to in an observation.

[구 SS-20] A New Method of Coronal Magnetic Field Reconstruction

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In the past two decades, diverse methods and computer codes for reconstruction of coronal magnetic fields have been developed. Some of them can reproduce a known analytic solution quite well when the magnetic field vector is fully specified by the known solution at the domain boundaries. In practical problems, however, we do not know the boundary conditions in the computational domain except the photospheric boundary, where vector magnetogram data are provided. We have developed a new, simple variational method employing vector potentials. We have tested the computational code based on this method for problems with known solutions and those with actual photospheric data. When solutions are fully given at all boundaries, the accuracy of our method is almost comparable to best performing methods in the market. When magnetic field vectors are only given at the photospheric boundary, our method excels other methods in “figures of merit” devised by Schrijver et al. (2006). Our method is expected to contribute to the real time monitoring of the sun required for future space weather prediction.

별 생 성

[구 SF-01] ALMA Observations of a Keplerian Disk in the Infalling Envelope of L1527

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We report Atacama Large Millimeter/submillimeter Array (ALMA) cycle I observations of L1527, a class 0 object with an infalling envelope and a rotating disk. HCO+ and HCN J=4-3 show strong redshifted absorption against the bright continuum emission associated with the optically thick disk or inner envelope. This redshifted absorption dip is an unambiguous evidence of infall. In addition, these lines and CS J=7-6 present the Keplerian rotation profile at their position-velocity diagrams, suggesting the formation of a Keplerian disk very early in star formation. We will present a model combining an infalling envelope and a Keplerian disk to fit the ALMA observations.

[구 SF-02] IGRINS observations toward Class I disk sources, IRAS03445+3242 and IRAS0429+2436

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We present the high-resolution Immersion GRating INfrared Spectrograph (IGRINS) spectra of two Class I sources, IRAS03445+3242 and IRAS04239+2436. Both sources show the evidence of Keplerian disks; the broadened CO overtone ($\Delta v=2$) transitions in emission and neutral metal lines (Mg I, Fe I, and Al I) in absorption. The thin Keplerian disk with a rotational velocity of ~100 km s-1 and a gas temperature of 5000 K at the innermost annulus can reproduce the CO overtone transitions including the bandhead emission. The outer dusty disk or the envelope needs to fit the narrow absorption features overlaid on the broad emission lines in the CO overtone transitions.

[구 SF-03] Infrared and Radio observations of a small group of protostellar objects in the molecular core, L1251-C