[구SE-09] Study of Magnetic Helicity Injection in the Active Region NOAA 9236 Producing Multiple CME Events

Sung-Hong Park[1], Kyung-Suk Cho[1], Su-Chan Bong[1], Young-Deuk Park[1]
[1]*Korea Astronomy and Space Science Institute*

In this study, we intend to inquire of how the temporal variation and spatial distribution of magnetic helicity injection in a CME-producing solar active region are related to the CME occurrence. We therefore investigate long-term (a few days) variation of magnetic helicity injection in the active region NOAA 9236 which produced multiple CME events. As a result, it is found that a noticeable increase in helicity of negative sign was first made for the first ~1.5 days and then 6 CMEs occurred while the relatively more injection of oppositely signed (positive) helicity was taking place for the next ~2 days. Afterwards, 2 CMEs in the region occurred while a more negative helicity is being injected again compared to a positive helicity. In addition, from helicity flux density maps, we found that the CMEs originated from this active region seem to be involved with the interaction of two magnetic field systems characterized by opposite signs of helicity.

[구SE-10] Development of Ballooning Instabilities in the Solar Atmosphere

Hongdal Jun, G. S. Choe*, and Sunjung Kim
School of Space Research, Kyung Hee University

A numerical simulation study of the solar coronal plasma reveals that a ballooning instability can develop in the course of flux rope merging. When magnetic field lines from different flux ropes reconnect, a new field line connecting farther footpoints is generated. Since the field line length abruptly increases, the field line expands outward. If the plasma beta is low, this expansion takes place more or less evenly over the whole field line. If, on the other hand, the plasma beta is high enough somewhere in this field line, the outward expansion is not even, but is localized as in a bulging balloon. This ballooning section of the magnetic field penetrates out of the overlying field, and eventually the originally underlying field and the overlying field come to interchange their apex positions. This process may explain how a field structure that has stably been confined by an overlying field can occasionally show a localized eruptive behavior.

*corresponding author