boundary, (4) minimize the difference between the estimated projection points with the observed ones. We apply this model to several halo CMEs and compare the results with those from other methods such as a Graduated Cylindrical Shell model and a geometrical triangulation method.

[구 SS-17] RADIAL AND AZIMUTHAL OSCILLATIONS OF HALO CORONAL MASS EJECTIONS

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We present the first observational detection of radial and azimuthal oscillations in full halo coronal mass ejections (HCMEs). We analyze nine HCMEs well-observed by LASCO from Feb 2011 to Jun 2011. Using the LASCO C3 running difference images, we estimated the instantaneous apparent speeds of the HCMEs in different radial directions from the solar disk center. We find that the development of all these HCMEs is accompanied with quasi-periodic variations of the instantaneous radial velocity with the periods ranging from 24 to 48 mins. The amplitudes of the instant speed variations reach about a half of the projected speeds. The amplitudes are found to anti-correlate with the periods and correlate with the HCME speed, indicating the nonlinear nature of the process. The oscillations have a clear azimuthal structure in the heliocentric polar coordinate system. The oscillations in seven events are found to be associated with distinct azimuthal wave modes with the azimuthal wave number m=1 for six events and m=2 for one event. The polarization of the oscillations in these seven HCMEs is broadly consistent with those of their position angles with the mean difference of 42.5°. The oscillations may be connected with natural oscillations of the plasmoids around a dynamical equilibrium, or self-oscillatory processes, e.g. the periodic shedding of Alfvenic vortices. Our results indicate the need for advanced theory of oscillatory processes in CMEs.

[구 SS-18] Algorithm for Detection of Solar Filaments in EUV

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In today's age when telecommunications using satellite has become part of our daily lives, one has to be employ preventive measures to avert any possible danger, of which solar activity is the major cause. Coronal mass ejections (CMEs) heading towards the Earth can lead to disturbances in the Earth's magnetosphere, if their magnetic field is oriented southward. Monitoring of solar filaments in this case becomes very very crucial, as their eruption is associated with most of the CMEs. Monitoring of solar filaments in this case becomes very very crucial, as their eruption is associated with most of the CMEs. Also, filaments show activation up to a few hours prior to launch of a CME and thus can provide advance warning. In this study, we present an algorithm for the detection of solar filaments seen in the extreme ultraviolet (EUV) from Atmospheric Imaging Assembly (AIA) on board the Solar Dynamics Observatory (SDO). Various morphological operations are employed to identify and extract the filaments. These filaments are then tracked in order to determine their size and location continuously.

[구 SS-19] Where is the coronal loop plasma located, within a flux rope or between flux ropes?

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Without scrutinizing reflection, the plasma comprising a coronal loop is usually regarded to reside within a flux rope. This picture seems to have been adopted from laboratory plasma pinches, in which a plasma of high density and pressure is confined in the vicinity of the flux rope axis by magnetic tension and magnetic pressure of the concave inward magnetic field. Such a configuration, in which the plasma pressure gradient and the field line curvature vector are almost parallel, however, is known to be vulnerable to ballooning instabilities (to which belong interchange instabilities as a subset). In coronal loops, however, ideal MHD (magnetohydrodynamic) ballooning instabilities are impeded by a very small field line curvature and the line-tying condition. We, therefore, focus on non-ideal (resistive) effects in this study. The footpoints of coronal loops are constantly under random motions of convective scales, which twist individual loop strands quite randomly. The loop strands with the axial current of the same direction tend to coalesce by magnetic