On the response of coronal activities and solar wind to solar filament disappearaces.

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Though solar wind monitoring satellites, such as WIND, well observe magnetic clouds, it is very difficult to relate activities on the sun and near the earth simply because of the long distance between the sun and the earth.Moreover, we cannot make a good guess if an ejected flux rope has southward field component or not. But this issue is very desired to be solved.

Nearly 30 events of solar disappearing filament were analyzed by getting 3-d velocity fields of them. The main targets of our research are to relate the disappearances of solar dark filament and 1) solar coronal activities observed by soft x-rays, 2) magnetic clouds.

Solar disappearing filaments and prominence ejections, once ejected against solar gravity, are often observed as CMEs(coronal mass ejection) in the outer corona. SOHO/LASCO observation revealed that CMEs have flux ropes in it (Chen et al,1997;Wood et al,1999;Dere et al,1999) which are sometimes observed as magnetic clouds near the earth. Magnetic clouds with southward field, they are thought to cause geomagnetic storms.

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Now, H alpha observation is the most convienient way to observe solar filaments. We have a good H alpha data obtained by Flare Monitoring Telescope at Hida observatory (Hida/FMT), which holds observation not only at H alpha center but also wing (+/- 0.8angstroms). This enables us to get 3-d velocity fields of disappearing filaments (this method is based on Beckers' cloud model (Beckers 1964)). With this method, we can know if the disappearing filament is actually ejected against solar gravity into outer corona or merely drain to the solar surface. We also find ,with 3-d velocity field, if the filament will travel toward us or not.

Nearly 30 events of solar disappearing filament were analyzed. The main targets of our research are the following two. 1) Classify the event into eruptive/non-eruptive and relate them to the coronal activities observed by soft x-ray telescope on-board Yohkoh. This is to investigate if the coronal activities (arcade loop formations) can be a measure of solar mass ejections. 2) In order to find relations between solar filament ejections and magnetic clouds near the earth, we calcurated the path of eruptive filaments and put them into two categories. One of them is eruptive filaments which is roughly on the way to the earth, and the other is not on it. Then, we found a relation between the magnetic cloud and the direction of filament's path.

Then our results can be summarized as ... 1) The eruptive events are well accompanied by coronal arcade (loop) formations, though non eruptive events are not. 2) If the direction of eruptive filaments point at the earth, magnetic clouds are more likely observed than events which point at far from the earth.