M34a TWO KINDS OF DOWNWARD-MOVING FEATURES OF $H\alpha$ SURGES AS AN EVIDENCE OF MAGNETIC FIELD RECONNECTION

H. Kurokawa and S. Sano

 ${\rm H}\alpha$ surge activities are found at the earliest stages of many emerging flux regions (EFR)(Kurokawa, 1988). We named EFR-surges for such surges that spout out from EFRs, and suggested that they are produced by the magnetic field reconnection between the EFR and the pre-existing coronal magnetic field (Kurokawa and Kawai, 1993).

In this paper we studied the morphological and dynamical characteristics of a typical example of EFR-surges observed with the high resolution $H\alpha$ imaging system of the Domeless Solar Telescope at Hida observatorty, Kyoto University. By carefully examining the relations among the $H\alpha$ images and Huairou magnetograms and their evolutional changes, we found two kinds of downward-moving features in the $H\alpha$ surge region: One is along the same magnetic field line as that of the upward-moving feature. The other is along a different magnetic field line where no upward-moving feature was found. It is shown that these two kinds of downward-moving features are well explained by a magnetic field reconnection between emerging magnetic loops and preexisting coronal magnetic field.

In addition this study indicates the importance of small scale emerging flux in the production of EFR-surges. It is necessary, Therefore, to observe the evolutional changes of magnetic field of such small emerging magnetic dipoles.