M30a An Energy Build-up Process for Homologous Flares using a Homologous Flare Series Observed in NOAA10314

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We present evidence of an energy build-up process of homologous flares in a newly emerged active region.

In March 2003, about 40 flares occurred in the same active region NOAA10314 within 6 days (March 15 – March 20). This active region has dual bipolar magnetic configuration that emerged on March 13, and was continually growing through this period. We report the characteristics of these flares using SoHO/EIT images, and pay attention to the evolution of the active region NOAA10314 using SoHO/MDI magnetograms.

We found: (1) Separating motions between positive and negative polarities of both the dipoles of this active region are seen in a time series of MDI magnetograms. This suggests that these dipole area are a currently emerging flux region. (2) At least 26 events occurred along the "main neutral line", which is the contact line between both expanding eastern and western dipoles. Other 11 events also showed correspondence to this "main neutral line". (3) We see structures resembling dual separatrix surfaces at both sides of flaring structures in EIT images before March 17. (4) In TRACE images, we see frequently a lot of tiny brightenings and mass motions near the photosphere in the area outside of the flaring region. This area corresponds to the eastern dipole area in the item (1). Based on these observations, we present a possible model of an energy build-up process in flares.

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