

**M39b****A Flare Due to the Interaction of a Small Loop and a Large Loop**

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Based on the photospheric vector magnetograms taken at Huairou Solar Observing Station of Beijing Astronomical Observatory, the high spatial resolution H alpha images taken at Hiraiso Solar Terrestrial Research Centre of Communications Research Laboratory, and the soft x-ray images taken by YOHKOH, the flare, occurred at 05:32 UT on September 5, 1994 in the active region NOAA 7773 was analyzed in this report. In soft x-ray images, a small loop and a large loop were identified during the flare. Four H alpha bright patches, corresponding to the footpoints of the two loops, were clearly shown, and each pair were separately situated at the different polarities in the magnetogram. The small loop connected the decaying of magnetic flux, not the emergence of magnetic flux as usually shown. These two loops matched very well to the extrapolated magnetic force lines by the Boundary Element Method with assumption of force-free field and observed photospheric vector magnetic field. Therefore, we can derive that there w

Soft x-ray observation showed obvious interactions between these two loops before the flare. They gradually merged to become one after the flare started, and the soft x-ray intensity monotonously increased during the merging process, agreeing with the simulated results of I-type coalescence derived by Fishiki et al (1995) and Sakai et al (1995).