

## **Hinode observations of coherent lateral motions of penumbral filaments during X-class flare**

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**Abstract.** The X-3.4 class flare of 13 December 2006 was observed with a high cadence of 2 minutes at 0.2 arc-sec resolution by HINODE/SOT FG instrument. The flare ribbons could be seen in G-band images also. A careful analysis of these observations after proper registration show flare related changes in penumbral filaments of the associated sunspot, for the first time. The observations of sunspot deformation, decay of penumbral area and changes in magnetic flux during large flares have been reported earlier in the literature. In this talk, we present observations of lateral motion of the penumbral filaments in a sheared region of the delta sunspot during the X-class flare. Such shifts have not been seen earlier. The lateral motion occurs in two phases, (i) motion before the flare ribbons move across the penumbral filaments and (ii) motion afterwards. The former motion is directed away from expanding flare ribbons and lasts for about four minutes. The latter motion is directed in the opposite direction and lasts for more than forty minutes. Further, we locate a patch in adjacent opposite polarity spot moving in opposite direction to the penumbral filaments. Together these patches represent conjugate foot-points on either side of the polarity inversion line (PIL), moving towards each other. This converging motion could be interpreted as shrinkage of field lines.