

M42a **Magnetic Configuration and Non-potentiality of NOAA AR 10486**

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Based on photospheric vector magnetograms obtained at Huairou Solar Observing Station, we have studied the evolution of magnetic configuration and non-potentiality in NOAA AR 10486 from October 23 to November 4, 2003. Seven X-class flares, including the largest solar flare (X-28) seen in recent years, and 15 M-class flares occurred in this region.

In this paper, we focus our analysis on the daily change of non-potentiality characteristics in the photospheric magnetic field from 26 to 30, October, when this active region was around the central meridian.

Our main results as following:(1)This active region have strong shear and twist transverse field.(2)There were new magnetic flux emergence during those days.(3)The magnetic shear angle distribution underwent dramatic change along the two main neural lines and have different domain sign. Similar characteristics have found for the vertical current systems and longitudinal current helicity.(4) The density of free energy around the neutral lines also has dramatic change. We suggest that the observed evolution of magnetic nonpotentiality represents a continuous transportation of magnetic energy and complexity from the lower atmosphere to the corona. This transportation seems to be responsible for the energy build-up for the series eruptive events in this active region. Moreover,the new magnetic flux emergence and magnetic flux cancellation, also might play a key role in this energy build-up process.