

Evolution of Magnetic Field Twist and Tilt in active region NOAA 10930

B. Ravindra¹, P. Venkatakrishnan², and Sanjiv Kumar Tiwari²

¹Indian Institute of Astrophysics, Koramangala, Bengaluru-560054, India

²Udaipur Solar Observatory, Badi Road, Udaipur, India

Magnetic twist of the active region has been measured over a decade using photospheric vector field data, chromospheric H α data, and coronal loop data. The twist and tilt of the active regions have been measured at the photospheric level with the vector magnetic field measurements. The active region NOAA 10930 is highly twisted emerging region. The same active region produced several flares and has been extensively observed by Hinode. In this talk, I will show the evolution of twist and tilt in this active region leading up to the two X-class flares. We find that the twist initially increases with time for a few days with a simultaneous decrease in the tilt before the X3.4 class flare on December 13, 2006. It appears that the twist increases at the expense of the tilt. The injected helicity into the corona is negative and it is in excess of 10^{43} Mx² before the flares. The injected energy is in excess of 10^{32} ergs before the flares