

Temporal evolution of the Sun's Polar Magnetic Patches as observed with Hinode

M06b

Anjali John K, Y. Suematsu, M. Kubo (NAOJ), S.Tsuneta (ISAS), D. Shiota (Nagoya University)

The Sun's polar region is covered by magnetic patchy structures. It is likely that large unipolar patches with $u_x \geq 10^{18}$ Mx determine the magnetic polarity of each poles and their total flux is modulated by the solar cycle. It is important to understand the temporal evolution of these large patches to derive information of magnetic activities in the polar region, especially, the mechanism of magnetic polarity reversal. We also like to investigate the interaction between magnetic patches and the polar faculae whose occurrence tends to be associated with the large magnetic patches, according to our previous study. To study the temporal evolution of magnetic patches, we obtained Hinode/SP and FG data for six hours of the south polar region in March 2013, where the magnetic reversal is progressing. All the SP and FG data are co-aligned to enhance the temporal resolution to FG cadence of 3 min and to know precise heliographic coordinates of magnetic patches. The data show that the large magnetic patches are formed by clustering of small patches of the same polarity and as time progresses dissolve into small patches, interacting with small opposite polarity patches. We will present the method of data analysis and preliminary results.