

**Association of Polar Faculae with the Polar Magnetic Patches as Revealed by Hinode Observations**

M11b

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Polar faculae, the small-scale bright magnetic structures observed at heliographic latitudes  $\geq 70^\circ$ , are considered as a good proxy for the polar magnetic field. When observed with Hinode SOT/SP, it is found that, the Sun's polar region is covered by patches that harbour strong magnetic field and that unipolar patches with flux  $\geq 10^{18}$  Mx determine the polarity of the polar field. The aim of this study is to understand the properties of faculae, which are believed to be associated with the polar magnetic patches. We analysed data of the north polar region taken by the Hinode/SOT- spectropolarimeter (SP) in September 2007. The brightness information of the polar faculae is obtained from the continuum intensity map. We defined the contrast of polar faculae as the ratio of continuum intensity to the average of the continuum intensity. The average of the continuum intensity is calculated by performing a least-squares surface fitting using a fifth-order polynomial in  $\mu$  (cosine of the heliocentric angle). Polar faculae within the magnetic patches are then identified using the following criterion: there must be minimum four pixels with contrast greater than  $4\sigma$ . We find that magnetic patches have fine structure with smaller faculae inside. Polar faculae magnetic flux account for only about 12% of the total flux from the polar region observed in this study. A positive correlation exist between the magnetic field and contrast of polar faculae. We confirm that the contrast of polar faculae decreases towards the limb.