

Center-to-limb variation of the internetwork magnetic field vector distribution derived from Hinode observations

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Abstract. We describe spectropolarimetric observations of the quiet Sun taken at four different heliocentric angles with the Solar Optical Telescope aboard the Hinode satellite. The Hinode spectropolarimeter observed the Fe I 630 nm spectral lines in its “deep” observation mode on February 5, 2009. The spatial resolution was 0.32 arc sec. The final effective integration time was 67 s, which led to a signal-to-the-noise ratio of ~ 3600 . The polarization spectra were then subjected to a Milne-Eddington inversion. We show the center-to-limb variation of the probability density functions of magnetic field strengths, inclinations, azimuths, and magnetic filling factors inferred from the inversion. We report that the distribution of magnetic field inclinations remains the same regardless the viewing angle variation, for magnetic fields with strengths below ~ 300 G. For stronger fields, variations on the shape of the field inclination distribution are detected. The latter suggests changes on the geometry of the average magnetic field vector with viewing angle. We argue that the distribution of inclinations of very weak fields in the Internetwork can be considered as a statistically isotropic phenomenon.