We used the HMI vector field inversion code to analyze different datasets from Hinode/SP to investigate the stability of the inversions near the limb and in quiet Sun regions. We have done that in two different ways. The first was employing the full spectral resolution of Hinode/SP: 31 wavelength positions across Fe I 6302.5. The second one considered only 6 wavelength positions obtained after convolving the original profiles with the HMI filters. Assuming the results from the former to be the correct ones, we have calculated the errors in the latter as a function of: magnetic field strength (Figure 1), and various parameters (Figure 2).

Finally, we have started evaluating different possibilities to account for the scattered light and non-magnetic contribution to the polarization signals. We will continue working on this topic in the future.

Figure 1 – Errors on the magnetic field strength (upper left), inclination (upper right), azimuth (lower left), and LOS velocity (lower right) as a function of the magnetic field strength.
Figure 2 – Errors on the magnetic field strength (upper left), inclination (upper right), azimuth (lower left), and LOS velocity (lower right) as a function of the magnetic field strength, inclination, azimuth and velocity, respectively.

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