
24 synoptic maps 1974-1982 (ascending phase of cycle XXI) of 323 prominence average magnetic fields measured by the Hanle effect

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Abstract

The observations of the Hanle effect (linear polarization) were performed by J.L. Leroy at the Pic-du-Midi coronagraph. The polarimetric accuracy is on the order of $1.e-4$. The polarimeter was equipped with a filter and the observed He I D3 line was globally observed and not resolved in its two components. The Hydrogen H_{alpha} or H_{beta} lines were quasi-simultaneously observed in the last years. Besides, the theory of the Hanle effect was developed in the density matrix formalism (Bommier, 1977, thèse de 3ème cycle, Bommier & Sahal-Bréchet, 1978, Bommier, 1980), and the inversion method developed (Bommier, Leroy, Sahal-Bréchet, 1981). The ambiguity is resolved by using the statistical results of Leroy, Bommier, Sahal-Bréchet (1984), confirmed by the multi- and optically thick line analysis of Bommier, Landi Degl'Innocenti, Leroy, Sahal-Bréchet (1994), and also unpublished results from two following days observations, where the geometrical change in the scattering due to the solar rotation, enables also the ambiguity solution (Bommier, Leroy, Sahal-Bréchet, 1981). The horizontality of the field vector was established by the Stokes II spectropolarimetric observations interpreted by Athay, Querfeld, Smartt, Landi Degl'Innocenti, Bommier (1983, 13 prominences) and Querfeld, Smartt, Bommier, Landi Degl'Innocenti, House (1985, 2 prominences), where the two components of He I D3 could be resolved (see also the multiline observations of Bommier, Landi Degl'Innocenti, Leroy, Sahal-Bréchet, 1994). In this poster, we present the synoptic maps of filaments of the Meudon Observatory, on which we have reported the 323 prominences average field vector (one field per observed prominence). The photospheric magnetic polarities and the neutral line are taken from the McIntosh maps. A general structure of the solar magnetic field above the neutral line, appears as a result.

Keywords: magnetic field, Hanle effect

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