Magnetic Field Diagnostics in the Low Corona from Microwave Circular Polarization Inversion

C. E. Alissandrakis

Secction of Astro-Geophysics, Department of Physics, University of Ioannina, Greece

The characteristics of polarization of the radio emission are determined by the emission mechanism and by the propagation conditions in the corona. In the case of weak coupling between the two electromagnetic wave modes, the polarization changes along the ray path, reflecting the local physical conditions; this results in inversion of the sense of circular polarization when a transeverse field region (TFR) is crossed. On the contrary, if the wave coupling is strong, the polarization is fixed and its sense does not change when a TFR is crossed. As a result, Stokes V maps of active regions do not always correspond to the magnetic polarities shown in photospheric magnetograms. The differeces depend on the wavelength, the heliographic position of the region, as well as on the density and the magnetic field of the corona, at about 0.1 $R_\odot$ above the photosphere.

In this short review I will present older and recent observation of polarization inversion and will discuss the diagnostics they provide on the magnetic field.