

Reconstruction of the 3D Magnetic Topology of Active Regions using 2D magnetograms

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Phenomena of the Solar Activity are caused by topological variation of magnetic field related to Active Regions. The interpretation and the modelling of these phenomena cannot have to do without the knowledge of the tri-dimensional magnetic topology, that spread in the Solar Corona starting from the Photosphere. On the other hand, the measure of magnetic field of the Active Regions is limited at the longitudinal component at photospheric level and from this component with different methods we can extrapolate the tri-dimensional configuration at higher heights. Consolidate numerical methods are based on the tri-dimensional solution of MHD equation and this imply a long time of calculation also for a region of limited extension. If we consider force-free and quasi-static coronal field, an analytical and numerical method recently proposed allow us to reconstruct the magnetic field starting from observations in different times of the longitudinal component, using stereoscopy of rotation, in a shorter time. The purpose of my work is the application to different cases of a numerical code, written in IDL language at the INAF-OATs, that implement the stereoscopic method to verify its functionality and the physical congruity of 3D topology reconstructions.