

Internal use only

Abstract number: S2-559

The active Sun and its implication for the heliosphere
no preference

Magnetic Connectivity between Active Regions 10987, 10988, and 10989 by Means of Nonlinear Force-Free Field Extrapolation

Tadesse, Tilaye¹, Wiegmann, Thomas¹, Inhester, Bernd¹ and Pevtsov, Alexei²

¹Max-Planck Institute for solar system research

²National solar observatory(NSO), USA

Extrapolation codes for modeling the magnetic field in the corona in Cartesian geometry do not take the curvature of the Sun's surface into account and can only be applied to relatively small areas, e.g., a single active region. We apply a method for nonlinear force-free coronal magnetic field modeling of photospheric vector magnetograms in spherical geometry which allows us to study the connectivity between multi-active regions. We use vector magnetograph data from the Synoptic Optical Long-term Investigations of the Sun survey (SOLIS)/Vector Spectromagnetograph(VSM) to model the coronal magnetic field, where we study three neighboring magnetically connected active regions (ARs: 10987, 10988, 10989) observed on 28, 29, and 30 March 2008, respectively. We compare the magnetic field topologies and the magnetic energy densities and study the connectivities between the active regions(ARs). We have studied the time evolution of magnetic field over the period of three days and found no major changes in topologies as there was no major eruption event. From this study we have concluded that active regions are much more connected magnetically than the electric current.