Evolution of global magnetic parameters in an active region with recurring ejective events

Marcelo López Fuentes[1], C. H. Mandrini[1], M. Poisson[1]

[1] *Instituto de Astronomía y Física del Espacio (IAFE, CONICET-UBA), Buenos Aires, Argentina*

Abstract:

A series of confined plasma ejections produced by minifilament eruptions, and accompanied by M-class flares, were observed in active region (AR) NOAA 11476 between May 8 and 10, 2012. These events, which have been analyzed in previous works, were associated with the presence of a small rotating bipole that emerged in the middle of the globally bipolar AR magnetic configuration. The bipole rotation concurred with the time interval within which the ejections were observed. The presence of magnetic flux cancellation was also identified along the polarity inversion line of the small bipole, where the minifilaments were recurringly formed and ejected. In this work, we analyze the evolution of a series of partial and global magnetic parameters of the AR to correlate them temporally and spatially with the observed events. For that aim, we use our own computations using magnetograms obtained with the Helioseismic Magnetic Imager (HMI) on board SDO, X-ray lightcurves obtained with the Geostationary Operational Environmental Satellite (GOES) and data from the Space-Weather HMI Active Region Patches (SHARP) database. Our final goal is to analyze how the studied parameters relate to the observed evolution and consider their utility as possible observable precursors of solar ejective events.

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