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## A Database of Photospheric Vector Magnetic Fields Properties in Flaring Active Regions

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The launch of the Solar Dynamics Observatory (SDO) with the Helioseismic and Magnetic Imager (HMI) and the Atmospheric Imaging Assembly (AIA) instruments, is the first time that both a vector magnetograph and ribbon-imaging capabilities became available on the same observing platform. This combination presented a first chance to do statistical studies of the properties of the vector magnetic fields participating in the flare. Here we present a statistical analysis of spatial and temporal properties of the vector magnetic fields in 40 active regions associated with flares, of GOES class C9.0 and greater. For every event in the database, we use 1) a pre-flare vector magnetogram from HMI/SDO, to describe magnetic field properties before the flare and 2) a sequence of AIA 1600A images, to track location of flare ribbons. We calculate the following physical properties of the photospheric vector magnetic field within the active region, flare ribbons and the polarity inversion line: magnetic flux, magnetic shear, vertical electric current and current neutralization. We present the results and discuss their meaning in the context of the standard flare model.

**Primary author:** Prof. KAZACHENKO, Maria (University of Colorado Boulder - National Solar Observatory, USA)

**Co-authors:** LYNCH, Benjamin (University of California, Berkeley); Prof. WELSCH, Brian (University of Wisconsin, Green Bay)

**Presenter:** Prof. KAZACHENKO, Maria (University of Colorado Boulder - National Solar Observatory, USA)

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