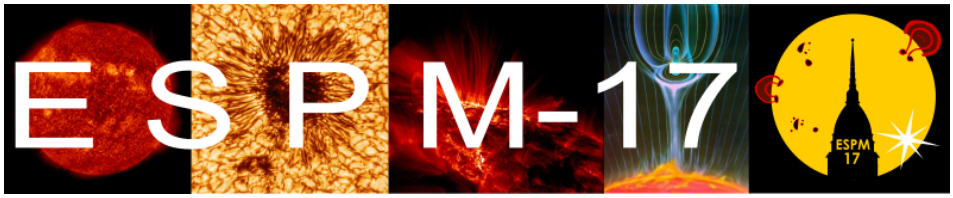

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A multi-wavelength investigation into the photospheric effects of a solar flare on 1 July 2012 using Swedish Solar Telescope observations

The solar flare event of 1 July 2012 13:08 UTC was observed in both the Hα 6563 Å and Fe I 6302 Å lines by the CRisp Imaging SpectroPolarimeter (CRISP) instrument at the Swedish 1-m Solar Telescope (SST), providing information about the connectivity and dynamics of the photosphere, chromosphere and corona. This study focuses on the changes in the sheared photospheric flow pre and post flare. Two pores and several bright points inside the flow pattern in the photosphere are tracked using the Local Correlation Tracking software package YAFTA. The border between two counter flows and the location of a polarity inversion line are identified, while the distance between two pores over time is monitored for the changes in properties of the magnetic field such as polarity, field strength and magnetic energy. The velocity flow vectors show the degree of shearing before and after the solar flare and the Poynting flux quantifies the magnetic energy evolution before and after the flare ribbon formation in the chromosphere. The SST results are combined with results from the Solar Dynamics Observatory (SDO), the Geostationary Orbital Environmental Satellite (GOES) and the FERMI Gamma-Ray Space Telescope providing a multi-wavelength evolution of this event in coronal plasma. The results indicate that the flare is driven by sudden changes in the magnetic field forced in the flows of the photosphere, resulting in the coupling of mass and energy between the layers.

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