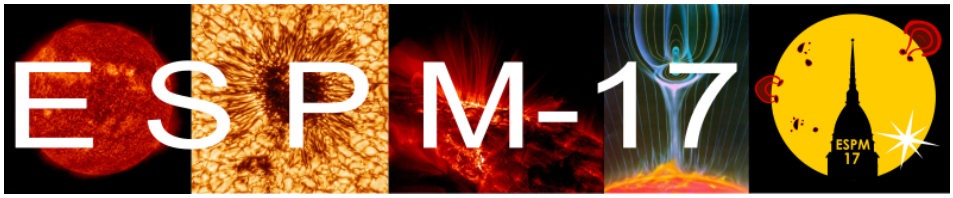


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# Locating sites of magnetic energy release in the 2022-10-02 X-class flare

Solar flares are driven by the release of free magnetic energy and are often associated with restructurization of the magnetic field topology. Observations of the evolving magnetic field in the flaring volume are limited to only one case, the X8.2 limb flare on 2017-09-10, where a coherent decay of the magnetic field in the corona was detected cospatial with efficient particle acceleration site at a cusp region. It remains unclear if this phenomenon is typical or exceptional. Here, we report another strong solar flare observed on the solar disk, whose microwave data permit mapping the magnetic field over the flaring source and tracking the magnetic field evolution over the course of the flare. This is done by model spectral fitting of the microwave imaging spectroscopy data obtained with NJIT's Expanded Owens Valley Array (EOVSA). The EOVSA images employed in this study were synthesized with overlapping 4 s time intervals and 2 s cadence at many frequencies between 2.5 and 18 GHz during the rise, peak, and early decay phases of the flare. The plasma parameters derived from this fitting display magnetic field decay in the loop top with the decay rate up to 10 G/s and in other locations.

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