

Current Events: The formation, growth, and development of a current sheet in an eruptive solar flare

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The standard model of coronal eruptions predicts that in the wake of an eruptive solar flare, magnetic field lines connecting the escaping plasma and the solar photosphere will stretch and reconnect in a current sheet. Here we report on what appears to be the direct observation of one such current sheet, which formed in the wake of a coronal mass ejection (CME) and X4.9 flare on 25 February 2014. Following the eruption, a faint, narrow structure extended from the solar surface upwards in the direction of the CME. We used DEM analysis to estimate the temperature of the structure, showing it was around 8 MK. We measured the approximate length and width of the structure with a combination of algorithm and visual inspection to determine the reconnection rate, which was about 0.004–0.007, consistent with previous studies of reconnection in current sheets. There have been only a few reports of this sort of measurement using data from AIA on SDO before, and the results support current flare models by confirming that the observed sheetlike structure has a temperature and a reconnection rate consistent with predictions by existing models.