FLUX ROPE FORMATION BY A CONFINED SOLAR FLARE PRECEDING A CORONAL MASS EJECTION

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Two categories of onset mechanism for solar eruptions (coronal mass ejections [CMEs], filament or prominence eruptions, and flares) are currently being debated. Ideal MHD mechanisms suggest the instability of a magnetic flux rope, thus, must assume that a flux rope exists at eruption onset. Reconnection mechanisms assume that a (not yet verified) mechanism of self-amplifying magnetic reconnection commences in a sheared magnetic arcade, triggering and driving the eruption and forming a flux rope as a result. Here we analyze an eruption event which strongly indicates that a magnetic flux rope was formed prior to a major CME by a preceding confined flare (i.e. a flare not associated with a CME). We also present evidence that such flux-rope-forming precursor flares often occur prior to CMEs, which lends support to the ideal MHD mechanism for solar eruptions.