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Association between a Failed Prominence Eruption and the Drainage of Mass from Another Prominence

Sympathetic eruptions of solar prominences have been studied for decades, yet identifying their causal relationships remains challenging. Here, we analyze a failed prominence eruption and subsequent mass drainage from a neighboring prominence, and investigate their potential connections. Leveraging stereoscopic observations from instruments such as LST, CHASE, and EU, we observe that the southern prominence (PRO-S) erupts with untwisting motions, accompanied by flare ribbons, and new connections form during the eruption. Notably, the northern prominence (PRO-N) rises following PRO-S, and its upper section disappears due to catastrophic mass drainage along an elongated structure. We propose that the eruption of PRO-S was initiated by the kink instability and facilitated by flare reconnection. However, it ultimately failed to erupt due to reconnection with surrounding magnetic fields. The elongated structure connecting PRO-N overlies PRO-S, and PRO-N mass drainage is triggered by PRO-S failed eruption. This study highlights that a prominence may terminate its life through catastrophic mass drainage, where the rising motion and mass drainage reinforce each other, and the mass drainage can be initiated by an underlying eruption.

Primary author: XUE, Jianchao (Purple Mountain Observatory)

Co-authors: FENG, Li; Prof. LI, Hui (Purple Mountain Observatory); TEAM, LST; TEAM, CHASE

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