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Trigger Shy: An Observational Study of a "Rosetta-Stone" Solar Eruption

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Coronal mass ejections, jets, prominence eruptions: solar eruptions are an active field with a broad range of accepted phenomena, and an even broader range of proposed mechanisms that cause the phenomena. This talk reports the observations of an event that connects the major eruption classes, and could provide a holistic explanation for all of them. The event originated in a filament channel overlying a circular polarity inversion line (PIL) and occurred on 2013 March 13 during the extended decay phase of the active region designated (sequentially) NOAA 12488/12501. This event was especially well-observed by multiple spacecraft and was seen to have the well-studied null-point topology. We analyze all aspects of the eruption using SDO AIA and HMI, STEREO-A, and SOHO LASCO imagery. One section of the filament undergoes a classic failed eruption with cool plasma subsequently draining onto the section that did not erupt, but a complex structured CME/jet is clearly observed by SOHO LASCO C2 shortly after the failed filament eruption. We describe in detail the long, slow buildup to eruption; the lack of an obvious trigger; and the immediate reappearance of the filament after the event. The unique mixture of major eruption properties that are observed in this event places severe constraints on the structure of the filament channel field and, consequently, on the possible eruption mechanism.

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