MINI-FILAMENT ERUPTIONS TRIGGERING CONFINED SOLAR FLARES OBSERVED BY ONSET AND SDO

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Using the observations from the Optical and Near-infrared Solar Eruption Tracer (ONSET) and the Solar Dynamics Observatory (SDO), we study an M5.7 flare in AR 11476 on 2012 May 10 and a micro-flare in the quiet Sun on 2017 March 23. Before the onset of each flare, there is a reverse S-shaped filament above the polarity inversion line, then the filaments become unstable and begin to rise. The rising filaments gain the upper hand over the tension force of the dome-like overlying loops and thus successfully erupt outward. The footpoints of the reconnecting overlying loops successively brighten and are observed as two flare ribbons, while the newly formed low-lying loops appear as post-flare loops. These eruptions are similar to the classical model of successful filament eruptions associated with coronal mass ejections (CMEs). However, the erupting filaments in this study move along large-scale lines and eventually reach the remote solar surface; i.e., no filament material is ejected into the interplanetary space. Thus, both the flares are confined. These results reveal that some successful filament eruptions can trigger confined flares. Our observations also imply that this kind of filament eruption may be ubiquitous on the Sun, from active regions (ARs) with large flares to the quiet Sun with micro-flares.