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Does the evolution of magnetic field geometry during a solar flare drive the generation of sunquakes?

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Solar flares are an explosive manifestation of complex magnetic loop reconfigurations in the vicinity of active regions in the solar atmosphere. During a flaring event, the magnetic field topology changes rapidly, abruptly, and significantly. Some of these eruptive events inject enough energy into the photosphere and subphotosphere to generate acoustic responses observed as sunquakes. The precise physical mechanism causing the acoustic source of a sunquake is still a topic of debate. However, Most authors agree that magnetic field re-structuring must play a fundamental role in causing such acoustic drivers. Previous studies have mainly probed the line-of-sight component of the magnetic field in such scenarios. In this work, we investigate the temporal and spatial evolution of permanent changes in the magnetic field geometry in a sample of five acoustically active flaring events using vector magnetograms acquired with the SDO/HMI instrument. The highly energetic events under study occurred during the past solar cycle 24, and cover a range of high and low GOES classes. The analysis carried out represents a crucial input for the investigation of sunquakes origin and dynamics.

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