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ALONG-STRIKE RUPTURE DIRECTIVITY OF THE STRONGEST CENTRAL ITALY EARTHQUAKES OCCURRED IN THE TWENTY LAST YEARS

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Along strike rupture directivity is a persistent feature in normal-faulting earthquakes in the Apennines. It has been already documented for many of the small to moderate magnitude events occurred in the last twenty years. In this study we extend the analysis increasing the number of the investigated earthquakes ($M_w > 4.0$) of the 2009 L'Aquila-Campotosto and 2016-2017 Amatrice-Norcia seismic sequences. Furthermore, we selected the strongest earthquakes ($M_w > 3.5$) occurred in the Val Tiberina area (Gubbio). The study is based on azimuthal variations of the high-frequency S wave amplitude using an empirical Green's function deconvolution method. Our approach allows us to statistically quantify the rupture directivity of each event through a directivity index ($0 < \text{IDIR} < 1$) that is a measure of the spectral separation above the corner frequency of the target event at opposite along-strike directions. Depending on IDIR, source ruptures are classified as unilateral, bilateral or circular. As already observed, it is confirmed that the direction of rupture propagation is not random. Same portions of the fault system activated during the 2009 and 2016-2017 sequences show a similar behaviour, with different sectors of the Apennines depicting an alternating trend of preferential along-strike rupture propagation directions. This feature, if confirmed by further data, could lead to more refined hazard assessments of the investigated region.