



The Campotosto seismic gap in between the 2009 and 2016-2017 seismic sequences of central Italy and the role of inherited faults in regional seismotectonic settings

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The 2016-2017 seismic sequence, in central Italy, was caused by the Mt. Vettore- Mt. Bove active fault system, which generated three mainshocks, the largest one of MW 6.5, on 30 October 2016. On 18th January 2017, four MW 5-5.5 seismic events nucleated on the Campotosto active fault, i.e. the southern segment of the Laga Mts. fault system. The segment is considered as potentially responsible for $M \sim 6.6$ seismic events and a “silent” seismogenic source, that is, a seismic gap. The fault also nucleated a Mw 5.4 aftershock during the 2009 seismic sequence. We here combined new geological/geomorphological field data, 1945 aerial photographs interpretation, geodetic (DInSAR and GPS) data and local historical seismicity analysis to determine how much of the Campotosto seismogenic source ruptured during the 2009 and 2016-2017 seismic sequences. We evaluated that the credible residual seismic moment of the Campotosto seismic gap corresponds to a Mw 6.43-6.56 earthquake. Moreover, we reviewed the regional tectonic setting and evolution; this allowed us a comprehensive reading of the seismotectonics of the region, in terms of both seismic potential and segmentation of the seismogenic sources, which results strictly connected to the long term (over tens of million years) activity of inherited lithospheric discontinuities.