



## **The 2014 Kefalonia seismic sequence and continuous microseismicity monitoring**

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On January 26, 2014 a strong ( $M_w 6.1$ ) strike slip earthquake ruptured the western part of Kefalonia Island, the area with the highest moment rate in the entire Mediterranean, at the southern part of Palliki peninsula. The sequence continued with numerous aftershocks that in the first few hours covered an area extended over 35 km, much longer than expected from the causative fault segment. Intense seismicity encompassing a major aftershock ( $M_w 5.5$ ) in less than 6 hours after and several  $M > 4.0$  earthquakes mostly during the first three days, continued along the entire activated area, evidencing a less densely covered part where the second main shock ( $M_w 6.0$ ) on 3 February occurred, associated with the adjacent fault segment, located to the north of the firstly failed segment and evidently encouraged by stress transfer of the first main shock. The aftershock distribution evidenced two adjacent fault segments striking almost N–S and dipping to the east, in full agreement with the centroid moment tensor solutions, constituting segments of the Kefalonia Transform Fault (KTF). Intense aftershock activity lasted for several weeks whereas continued seismicity afterwards is mainly located off fault with minor and fewer on fault aftershocks. The seismic network was intensified in the area (Institute of Geodynamics portable network, seismic stations installed in the frame of OTRIONS project, CEN–ION network) after the main ruptures, providing improvement both in detectability and accurate locations. Since network coverage was not previously adequate for revealing detailed features of the activated area, the improved monitoring and location is of paramount importance for this scope. More recent seismicity, forming distinctive clusters, occurred along the edges of the double rupture indicating activation of adjacent fault segments. To the north several aftershocks forming an east–northeast striking seismicity band suggest a transfer zone linking KTF with its northward continuation, the Lefkada Fault. The south cluster, with the larger earthquake of  $M_w 5.1$ , reveals again an almost E–W striking fault segment, placed obliquely to the regional stress field that is characterized by ENE–WSW almost horizontal compression and NNW–SSE almost horizontal tension. The off fault clusters may well be interpreted as triggered by stress transfer of the main ruptures, whereas they shed more light on the regional seismotectonic properties, an indispensable component for the seismic hazard assessment in this notably high seismicity area.