

The 2015 Lefkada earthquake sequence (W. Greece)

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Lefkada Island is situated in the Ionian Sea (W. Greece), one of the most seismically active regions in the Mediterranean. Seismicity in the region is mainly related to the dominant tectonic feature, which is the Cephalonia-Lefkada Transform Fault Zone (CLTFZ). The majority of the strong events that caused damage to the island, both during the historical and the instrumental era, occurred in the vicinity of its NW part, with the most recent being the $M_w=6.3$ 2003 earthquake. Destructive events do not occur that often in the SW part. The recent 17 November 2015 event ($M_w=6.4$) occurred on the western-southwestern part of Lefkada Island, causing some damage, landslides and ground fissures. A local velocity model was determined aiming to the accurate location of hypocenters. The latter resulted to mean horizontal (ERH) and vertical (ERZ) location errors of the events in the broader study area smaller than 1 km. Following, a relocation procedure took place in order to distinguish sub-clusters belonging to the aftershock sequence. Three main groups were identified. The northern in the central part of the island, where the majority of aftershocks is located. The central along the main activated fault, characterized by relatively low seismicity, as the major energy part was released during the occurrence of the mainshock. The southern, offshore Lefkada including several clusters towards Cephalonia island, with a general E-W orientation. It is worth noting that events occurred at the northern and southern end of the activated region within minutes following the mainshock. Source parameters of the mainshock and of the major events were determined using moment tensor inversion. According to the obtained focal mechanisms, an almost vertical right lateral strike slip fault, in agreement with the ENE-WSW oriented CLTFZ, was activated. The obtained results led to a complex deformation pattern, in the framework of which the northern part is related to the CLTFZ, whereas the southern one, between Lefkada and Cephalonia islands, to parallel fault zones of NE-SW orientation that form a small step-over of minor E-W trending faults.

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