



## **Surface deformation due to the M6.5 Lefkada earthquake (17 November 2015) exploiting SENTINEL-1 and GNSS observations. Implications for seismic hazard.**

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The 17 November 2015  $M=6.5$  Lefkada earthquake in the Ionian sea, Greece, produced tens of centimetres of co-seismic motion in both Lefkada and Cephalonia islands. We present the full picture of the co-seismic displacements as mapped by space geodetic techniques, Sentinel 1A INSAR and permanent GNSS stations. We use this data together with the constraints from seismology to invert for fault localisation, size and slip distribution.

We observed post-seismic displacements throughout most of southern Lefkada and northern Cephalonia islands recorded at the two NOA GNSS stations of PONT and SPAN and four additional permanent and six campaign GNSS stations established after the earthquake. Those displacements range from a few centimetres near the epicentre to a few millimetres far from the fault. We model the post-seismic displacements as due to uniform slip on the same fault plane that ruptured during the main event.

The model shows a right-lateral afterslip along the fault but with slightly larger extension in comparison to the co-seismic slip, less shallow and deeper. This transient strain followed the main event during a short period of 80 days as modelled with an exponential law.

Currently, the post-seismic deformation is being investigated by exploiting multi-temporal Sentinel 1A/B InSAR processed among others with ESA's Geohazards Exploitation Platform and SNAP software. The first challenging issue is the coherence which is not high in the area due to the vegetation cover. The second one is the correction of the tropospheric component. We estimate it using the tropospheric delay at the permanent GNSS stations and by using an meteorological model based on the WRF refined at the spatial resolution of 1 km.

The earthquakes occurred in the Central Ionian area since 1983, studied both by seismology and space geodesy imply a seismic gap offshore NW Cephalonia that needs to be monitored.