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The surface faulting produced by the 21 August 2017 Mw 4.0, Ischia island (Southern Italy) earthquake

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On August 21, 2017 at 20:57 (local time) an earthquake with Mw 4.0 (Lat. 40.74°, Long 13.90°, hypocentre's depth at about 2 km) hit the Ischia island. The earthquake heavily damaged the Casamicciola Terme village reaching the VIII EMS maximum intensity at Piazza Maio and caused two fatalities and widespread damages in the Fango district (Lacco Ameno village), I=VII EMS.
Although, the Casamicciola earthquake is a small size volcano-tectonic event, it produced several ground coseismic effects as recognized for shallow earthquakes occurring in other volcanic areas.
Soon after the mainshock, a composite surveying team (EMERGEO Working Group, http://emergeo.ingv.it/ and CNR / IAMC), activated in the epicentral area to collect data on the coseismic ground effects, recording more than 100 geological field observations. In detailed were collected coseismic fractures and ruptures, some modest gravitational phenomena such as small size collapses of some m3 and small landslides in volcanoclastic deposits and widespread coseismic effects related to the shaking e.g., collapse of drywalls.
Field mapping was mainly carried out using the smartphone's GPS equipped with software using compass and orientation sensors (Rocklogger; My Tracks; Earthquake GeoSurvey). The whole data set was stored and managed in a georeferenced database by means of an ESRI ArcGIS platform. Additionally, to achieve an accurate documentation of the most prominent coseismic ground effects, the post-earthquake survey was supported by Remotely Piloted Aircraft Systems (RPAS) equipped with a Sony Alpha 6000 camera and a Flir SC655 thermal camera.
The coseismic ruptures collected show a medium WSW-ENE to E-W predominant strike, with total length of about 2km and vertical component of movement always with constant kinematics north side down. The extensional component of the movement is accommodated by open cracks with a maximum opening of 3cm and an offset of maximum 2cm.
According to the pattern of coseismic effects, the area of ground deformation was identified along the fault systems E-W-WSW-ENE in Northern sector of the Mt. Epomeo, already mapped in literature as active structures.
All seismo-geological features (length, geometric pattern, movement direction, offset, relationship with the topography, comparison with structural setting and seismological historical data), lead to hypothesize the observed dislocation could be defined as primary surface faulting of the 21 August 2017 volcano-tectonic event (Mw 4).
Moreover the primary and secondary coseismic geological collected data allowed us to assess the preliminary intensity of VII ESI scale.