



Imaging upper crust structures at Sierra Negra volcano, western Galapagos archipelago, Ecuador

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Sierra Negra has a shallow, elliptical caldera (7×10 km) and is one of the most active volcanoes in the Galapagos Archipelago, located approximately 1000 km west of continental Ecuador. The most recent unrest of Sierra Negra started when an increase of seismicity was recorded at permanent seismic stations on the islands in July 2017. The increase ended with a magnitude 5.3 earthquake on 26th June 2018 at 09:15 UTC. An intense seismic swarm commenced after a few hours of relative seismic quiescence, and later evolved into tremor. Eruptive fissures were observed at the north flank of the volcano, which marked the onset of the eruption (around 20:00 UTC).

While the seismic amplitude ratio method suggested different persistent source locations throughout the day of the eruption day the structures that produce these sources are still unclear. Using time-lapse local earthquake tomography (before and after the eruption time) together with the seismic amplitude method could help in the further understanding of the geodynamics of the volcano. In this study we performed a 3D seismic tomography inversion for the Sierra Negra area using P-wave arrival times of the local earthquakes recorded at 14 temporary and 5 permanent stations. The preliminary results illustrate two relatively low velocity anomalies reaching the surface where the seismic amplitude method documented the persistent sources.