



## **3D structure of the crust and uppermost mantle beneath Merapi and Lawu volcanoes, Central Java, from local source seismic tomography**

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Central Java is part of the Sunda Arc, one of the hazardous active collision belts on earth. Here we present the results obtained from a unique data set collected at a temporary seismic network consisting of more than 100 stations operated in Central Java during more than 150 days. In total more than 13,000 P and S arrival times from 292 events were used to study the 3D velocity structure in the crust and the mantle wedge above the down going slab beneath Central Java. Thorough testing based on reconstruction of chess board patterns and real-shaped synthetic anomalies was performed. Locations of events clearly image the shape of the subduction zone beneath the Central Java which has gradual increase in dipping angle from almost horizontal to about 70°. The distribution of local seismicity gives the evidence for a double seismic zone in the slab at 80-150 km depth. The most striking feature of the obtained velocity structure is a strong low-velocity anomaly (-15 %) in the crust between Merapi and Lawu volcanoes (MLA) observed both in P and S velocities. It can be interpreted as feeding area of both volcanoes. The volcanoes are located at the southern limit of the MLA. The explanation can follow from possible concentration of ascending fluids along the inclined boundary between the rigid high velocity forearc crust and the low-velocity backarc area. The low-velocity anomaly at the SW edge of the study area can reflect compressional fracturing and thickening of the crust just behind the Java trench.