P- and S-wave Velocity Structure beneath Central and East Java, Indonesia: Preliminary Result

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The Central and East Java region is part of the Sunda Arc which has an important role in producing destructive earthquakes and volcanic complexes as a result of the subduction of the Indo-Australian plate under the Eurasian plate. Seismic tomography is one geophysical tool that is adaptable to understanding the mechanism process related to tectonic activity, seismicity, and volcanism. We collected a series of waveforms from 1,519 events in the period January 2009 to September 2017 and re-picked 11,192 phases for P- and S-waves at 34 stations of the BMKG network. We determined the 3-D P- and S-wave velocity structure beneath this high-risk region down to a depth of 200 km. In this study, we compare the tomographic images and relocated seismicity in order to represent the subducted slab geometry and the features in the seismic zones, i.e. the 2006 Yogyakarta earthquake zone (Opak fault), south of the mainland, and the 1994 Banyuwangi earthquake zone. Low-velocity anomalies beneath the volcanoes, i.e. Merapi, Merbabu, Kelud, Semeru, Bromo, and Ijen also imply the existence of fluid material and possible partial melting of the upper mantle which migrated from the subducted slab.