

EGU24-3393, updated on 05 Oct 2024

<https://doi.org/10.5194/egusphere-egu24-3393>

EGU General Assembly 2024

© Author(s) 2024. This work is distributed under the Creative Commons Attribution 4.0 License.



Preliminary Results of P-wave tomographic imaging beneath Sulawesi, Indonesia

Pepen Supendi^{1,2}, Nicholas Rawlinson¹, Jifei Han¹, Sri Widiyantoro^{3,4}, and Dwikorita Karnawati²

¹Department of Earth Sciences – Bullard Labs, University of Cambridge, Cambridge CB30EZ, United Kingdom

(ps900@cam.ac.uk)

²Agency for Meteorology, Climatology, and Geophysics, Jakarta 10720, Indonesia

³Global Geophysics Research Group, Faculty of Mining and Petroleum Engineering, Institut Teknologi Bandung, Bandung 40132, Indonesia

⁴Faculty of Engineering, Maranatha Christian University, Bandung 40164, Indonesia

The island of Sulawesi is located within a complex tectonic region at the confluence of the Eurasian, Indo-Australian and Philippine plates. The recent geological history in the area reflects the ongoing subduction, extension, obduction, and collision of continental fragments. The island consists of four elongated arms (the north, east, southeast, and southern arms) that are composed of distinct lithological assemblages. Based on local and regional earthquake travel-time tomography, we present a new 3-D P-wave velocity model of the crust and upper mantle beneath Sulawesi. We used the Fast Marching Tomography (FMTOMO) package to retrieve 3-D P-wave velocity variations relative to a 1-D starting velocity model based on ak135. The catalogue and phase data were taken from the Agency for Meteorology, Climatology, and Geophysics (BMKG) of Indonesia for the period 2018 through to 2023, recorded by 126 seismic stations in Sulawesi and its neighbourhood. Our preliminary results reveal clear evidence of subducted slabs as indicated by high-velocity anomalies penetrating into the mantle along the Molucca Sea Collision Zone and to the north of Sulawesi; we also see a low-velocity anomaly beneath volcanoes located at the eastern end of the North Arm of Sulawesi.