

Crustal Structure Along Sunda-Banda Arc Transition Zone from Teleseismic Receiver Functions

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Abstract

We analyzed receiver function of teleseismic events recorded at twelve Indonesian-GEOFON (IA-GE) broadband stations using non-linear Neighbourhood Algorithm (NA) inversion and $H-k$ stacking methods to estimate crustal thickness, V_p/V_s ratios and S-wave velocity structure along Sunda-Banda arc transition zone. We observed crustal thickness of 34-37 km in Timor Island, which is consistent with the previous works. The thick crust (> 30 km) is also found beneath Sumba and Flores Islands, which might be related to the arc-continent collision causing the thickened crust. In Timor and Sumba Islands, we observed high V_p/V_s ratio (> 1.84) with low velocity zone that might be associated with the presence of mafic and ultramafic materials and fluid filled fracture zone. The high V_p/V_s ratio observed at Sumbawa and Flores volcanic Islands might be an indication of partial melt related to the upwelling of hot asthenosphere material through the subducted slab.

Key words: Receiver function, crustal structure, Sunda-Banda arc transition zone.