The mid-mantle seismic discontinuity beneath Indonesia using the receiver function method for data from the JISNET

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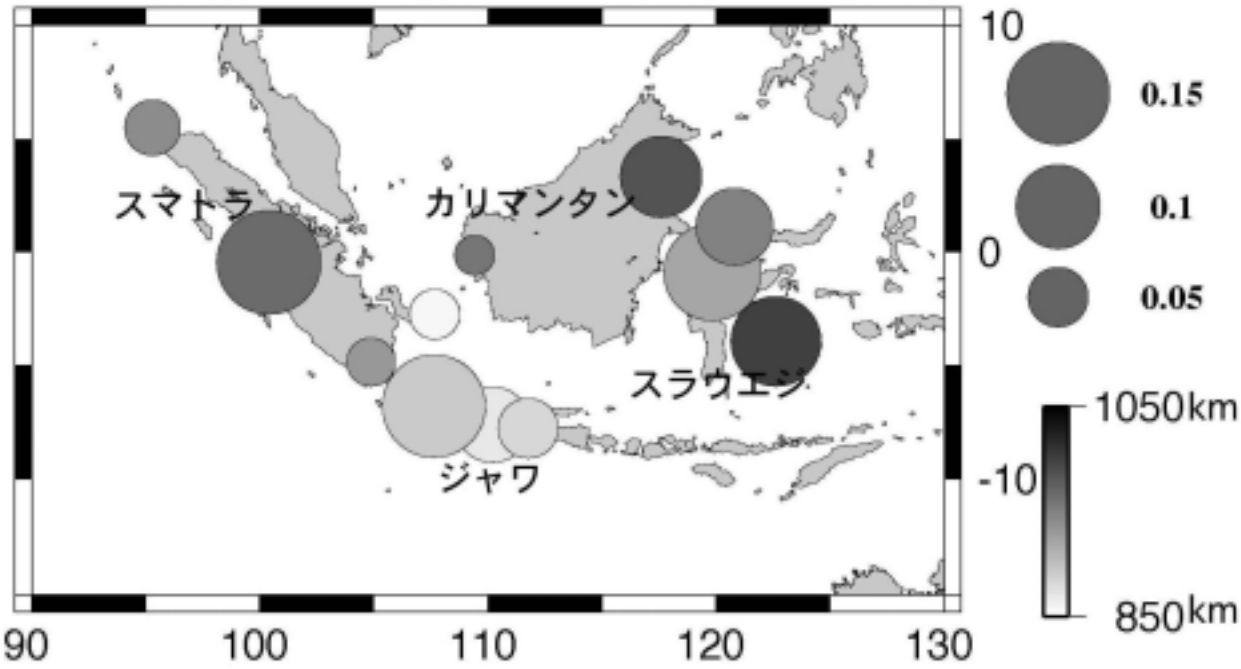
Several tomographic studies shows high velocity anomaly in the lower mantle beneath Indonesia which is considered as the subducted slab (e.g., Fukao et al., 1992). Niu and Kawakatsu (1997) suggest the mid-mantle discontinuity beneath Indonesia at depths between 900 and 1100 km using P-to-S converted waves beneath the events. They suggested that this discontinuity is related to subducted slab in the lower mantle. Region for investigation using P-to-S converted waves beneath the events are restricted beneath the events. Tomographic images show that the high velocity regions in the lower mantle are widely spread around beneath Kalimantan. Thus to examine the correlation between the mid-mantle discontinuity and the high velocity region, it is necessary to examine the existence and the depth of the discontinuity around beneath Kalimantan.

The receiver function method is suitable for examining the nature of the discontinuity beneath stations. We deployed the broadband seismic network in central and western Indonesia which includes Kalimantan (called JISNET) [Ohtaki et al., 2000]. In this study, we examine the distribution and the depth of the mid-mantle discontinuity beneath Indonesia using the receiver function method discussed in Staita et al. [2002] using waveform data recorded at 23 JISNET stations in Sumatra, Java, Kalimantan, and Sulawesi during 1998-1999 whose turning points of the ray are deeper than 1200 km, and have good S/N ratio. Iasp91 [Kennett and Engdahl, 1991] are used as the reference model.

The depths of the maximum peaks between 850 and 1050 km depths at each station are shown in the figure. Sizes of the symbols indicate the peak amplitudes of stacked receiver functions. In Western Indonesia expect for PPI in Sumatra, the amplitude of the peaks are smaller compared with other regions. In Jawa Island, the depths of the peaks are shallower than 900 km. In eastern Kalimantan and Sulawesi, the depths are between 920 and 1000 km, which are deeper than the depths in other two regions. Niu and Kawakatsu (1997) reported the depth beneath the Jawa Island as between 1000 and 1100 km, which is deeper than our results. The receiver function we obtained shows another peak exists at depths between 1050 and 1200 km, although it is weaker at almost stations. Their peak may correspond with this peak.

We will reanalyze the JISNET data with data during 2000 - 2002 as well as OHP and IRIS broadband stations around Indonesia.


スマトラ
カリマンタン
スラウエシ
ジャワ
10
0
-10
90
100
110
120
130
0.15
0.1
0.05
1050km
850km