



Ambient Noise Tomography of central Java, with Transdimensional Bayesian Inversion

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Delineating the crustal structure of central Java is crucial for understanding its complex tectonic setting. However, seismic imaging of the strong heterogeneity typical of such a tectonically active region can be challenging, particularly in the upper crust where velocity contrasts are strongest and steep body wave ray-paths provide poor resolution. We have applied ambient noise cross correlation of pair stations in central Java, Indonesia by using the MERapi Amphibious EXperiment (MERAMEX) dataset. The data were collected between May to October 2004. We used 120 of 134 temporary seismic stations for about 150 days of observation, which covered central Java. More than 5000 Rayleigh wave Green's function were extracted by cross-correlating the noise simultaneously recorded at available station pairs. We applied a fully nonlinear 2D Bayesian inversion technique to the retrieved travel times. Features in the derived tomographic images correlate well with previous studies, and some shallow structures that were not evident in previous studies are clearly imaged with Ambient Noise Tomography. The Kendeng Basin and several active volcanoes appear with very low group velocities, and anomalies with relatively high velocities can be interpreted in terms of crustal sutures and/or surface geological features.