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Identification of the Existences of the Mud Volcanoes Beneath East Java-Indonesia Region Using Ambient Noise Tomography Method

Eruption of hot mud volcano in East Java(LUSI) is a disaster that resulted in enormous material loss. This eruption located in areas rich in oil and gas. Eruption is very threatening a lot of people, because there are a lot of pipelines are located in this area. The existence of this eruption is not the first in the research area,there were already 13 times occurred in the different location and times. To generate a the imaging of the subsurface beneath the research area,we use ambient noise tomography method. We used seismic data that were recorded at 80 seismographs spread in East Java. We constructed the inter-station Rayleigh wave Green's functions through cross-correlations of the Z component of seismic noise recordings at 1400 pairs of stations. We used the Neighborhood Algorithm to construct depth profiles of shear wave velocity (Vs). The results of the imaging showed the existences of low Vs anomaly beneath LUSI at a depth of 1.7km. Based on paleontological analyzes, this anomaly is identical to the hot mud volcano. The existence of these anomalies are scattered beneath the surface areas that never experienced a mud volcano eruption, but the lowest anomalies are beneath LUSI area and Madura strait.

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