

Seismic activity around Guntur volcano, West Java, Indonesia

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Guntur is a volcano complex located 35 km SE of Bandung, West Java, Indonesia. Explosive eruptions frequently occurred at Guntur crater during the period from 1690 to the middle of 19th century, however, no eruption has occurred for 167 years after the 1843 eruption. In spite of dormancy of eruptivity, seismicity of the Guntur volcano is high and earthquake swam sometimes occurred.

In order to monitor the volcano, Volcanological Survey of Indonesia (present: Center for Volcanology and Geological Hazard Mitigation) and Sakurajima Volcano Research Center, DPRI, Kyoto University installed seismic network composed of 4 stations at the southern flank of the volcano for precise hypocenter determination in 1994. The hypocenters were aligned from SE to NW along the central cones and west of the summit at depth 3-5km. In Kamojang and Darajat geothermal area, the hypocenter aligned from SW to NE along the volcano at depth 3-8 km (Sadikin et al., 2007). The hypocenters at the geothermal area were not well determined due to insufficient coverage of the network.

In order to locate the earthquakes more precisely, we use permanent seismic station at volcanoes around Guntur. These are Papandayan, Galunggung, Tangkubanperahu, Ciremai and Gede volcanoes. In addition, 4 temporary seismic stations were installed north of Guntur volcano and south off (DAN, WNS, HLM and TRJ stations) to improve coverage of the seismic network. Hypocenters were determined for local tectonic earthquakes with S-P times < 4 s during the period from January to October 2009 by using P and S waves, based on velocity structure utilized by BMKG. Hypocenter zone at the geothermal area SW of the Guntur volcano are widely distributed at depths around 3- 9 km. The hypocenter zone extends southwestward near Papandayan volcano and westward. Hypocenters were not determined near Cikuray volcano by the previous study. Hypocenters are aligned from north to south at eastern flank of the volcano at depths around 6 km. No historic eruptions were recorded at the volcano. We have to examine the hypocenter distribution and focal mechanism in relation with alignment of faults around Guntur volcano.

Keywords: volcanic earthquake, seismicity, Guntur volcano, mid and long-term prediction