Investigating Ground Deformation at Krakatoa Volcano Derived From InSar and Local Seismic Tomography Analysis

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SUMMARY

One of the deadliest volcanic eruption in world history is the Krakatoa eruption on August 27, 1883. The eruption created caldera-forming which destroyed two-thirds of the Krakatoa volcanic island in the Sunda Strait resulting in the remaining of three small islands later known as the Krakatoa complex. The eruptive periods were between 1-8 years and on average between 2-4 years earlier. Eruptions in the center of Krakatoa complex have produced a new volcano named Anak Krakatoa, which is continuously building its body through eruptions until now. Previous records indicate that Mt. Krakatoa is dominated by Strombolian eruptions with relatively mild explosives at discrete but fairly regular intervals of seconds to minutes. Eruptions were characterized by Strombolian activities of pyroclastic and lava flows. We observed the ground deformation of Anak Krakatoa Volcano by interfering PALSAR-2 data from 2014 to 2015. A map of the averaged LOS velocity identifies actively the deforming volcanoes related to subsurface magma or hydrothermal movements. Another most interesting feature of this study is a zone of high Vp/Vs ratio beneath the Krakatoa complex. The comparison result of the technique shows a complex pattern of ground deformation. Inflation up to 3 cm, together with subsidence around the crater. The southwest side of the volcanic cone has been subsided by 10 cm, whereas the northeast side of the cone uplifted 8 cm in almost a year and causing significant volcano-wide subsidence and initiating a new interruption deformation cycle. We assumed the magma reservoirs beneath the Krakatoa complex as sponge-structured volumes that may quickly change the body of volcano rapidly through the volcanic system of Krakatoa.

Keywords: Krakatoa, Volcano, Monitoring, ,Eruption, Radar
