



Merapi's lava dome splitting explosion on 18 November 2013 observed by lidar and digital image correlation analysis.

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After the 2010 Merapi eruption, the lava dome in the summit of the volcano was firstly growing and then subject to gradual cooling and contraction. In November 2013, a major phreatomagmatic explosion occurred, which caused an eruption column rising over 2 km high and destroyed a number of monitoring instruments in the near field. Bombs were thrown out over 1 km distance.

The eruption produced volcanic ash and very fine materials. Deformation data from tilt or EDM showed no wide inflation or deflation associated with this eruption. In addition, high resolution TerraSAR-X data analysis also showed no edifice-wide deformation (Walter et al., 2015). Here we further examine two datasets to determine the morphologic and structural effects of this eruption. First we exploit fixed installed monitoring cameras and use a digital image correlation method to investigate geometric changes before and after the eruption. Second we acquired a high resolution terrestrial Lidar data set after the explosion and compared this another lidar data set acquired before. The result shows details on the splitted dome, the volume of the eruption and thickness of the deposits, and suggests that a new block at the front of the dome is inherently unstable and might break off to form a block and ash flow in the near future.

Reference:

TR Walter, Subandriyo J, Kirbani S, Bathke H, Suryanto W, Aisyah N, Darmawan H, Jousset P, Lühr BG, Dahm T (2015) Volcano-tectonic control of Merapi's lava dome splitting: The November 2013 fracture observed from high resolution TerraSAR-X data. *Tectonophysics* 639, 12 January 2015, Pages 23–33. doi:10.1016/j.tecto.2014.11.007