

The influence of topographic grid size on lava flow simulation-Using the example of the Kenmarubi lava flow of Mount Fuji-

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The hazard map of Mount Fuji regarding volcanic disasters was published in 2004. This map shows the prospective affected area of lava flows, pyroclastic flows, lahars due to snow melt, and volcanic ashes based on the results of numerical simulations. At that time, the resolution of the Digital Elevation Model (DEM) used for simulations was 200m square. It has been 10 years since the first hazard map was published, and we have since produced higher resolution map using the laser scan of the topography. In this study, we used the higher resolution DEMs and simulated the Kenmarubi lava flow (AD1000) with the LavaSIM simulation software. The simulation results run with the finer grid size of the DEM produced a faster lava flow, and reached the foot of the mountain faster than the lava flow with the coarse grid DEM. Even though we ran the simulation with the same duration of lava flow, the lava flow spread over wider area and became thinner when the grid size of the DEM was coarse. Thus, the simulated lava flow properties (i.e. flow area and duration) strongly depends on the grid size of the DEM. In conclusion, we should use the appropriate grid size for the numerical simulations depending on the types of flows, and understand that there are some errors related to the grid size of the DEM when we construct and use hazard maps of volcanic eruptions.

Keywords: topographic grid size , Numerical simulation, Lava flow, Mount Fuji