

Visit to University of Tokyo -- Summary

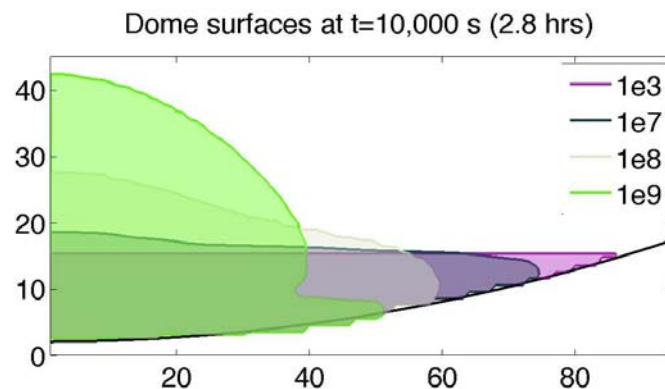
Visitor: Einat LEV

Host: Fukashi MAENO

Period of stay: September 1st to November 25th, 2014

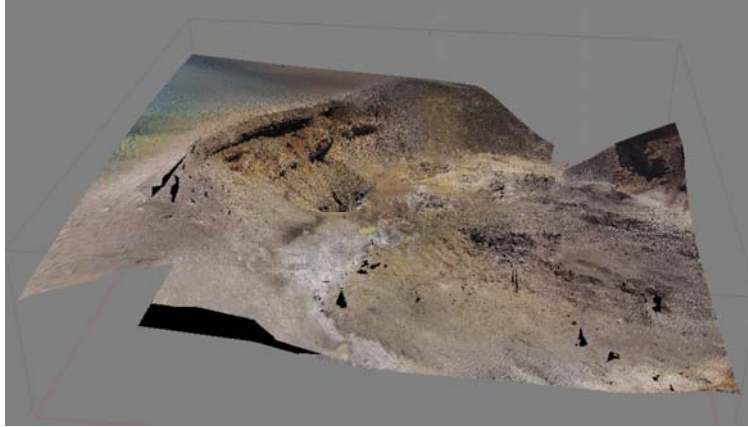
During my stay at ERI, I was hosted by Maeno-san and the Volcano Research Center (VRC). My projects at ERI focused on several aspects of physical volcanology and complex fluid rheology:

- 1) **Shinmoedake 2011 eruption:** I joined the effort to understand the rheology of the lava emplaced during the effusive dome-building phase of the 2011 eruption. My work included constructing of numerical models with varying rheology parameters, in attempt to find best fit with observed dome evolution.
 - a) My models show that the viscosity calculated by some previous studies is probably too high, and that the estimation by Ichihara et al., (2013) is probably more accurate.
 - b) My models also considered the influence of the topography of the crater before the eruption, which had not been done by past studies. My results showed that the topography make estimating the viscosity much more difficult than previously thought.



- c) I also began to look at the influence of temperature-dependent viscosity on the shape of the lava dome. The dome temperature changes over time, leading to a viscosity that changes over time. In the future I hope to expand these models, and also to introduce eruption flux that changes over time, as suggested by geodetic measurements.
- 2) **Field trips:** I was lucky to join two field trips to Japanese volcanoes during my visit:
 - a) To get a better sense of what Shinmoedake volcano looks like, I was happy to join a field trip organized by Maeno-san, Ichihara-san, and Takeo-san from ERI, to Shinmoedake in September. This trip helped me greatly to learn about the sequence of events of the 2011 eruption. During our field trip, I collected aerial

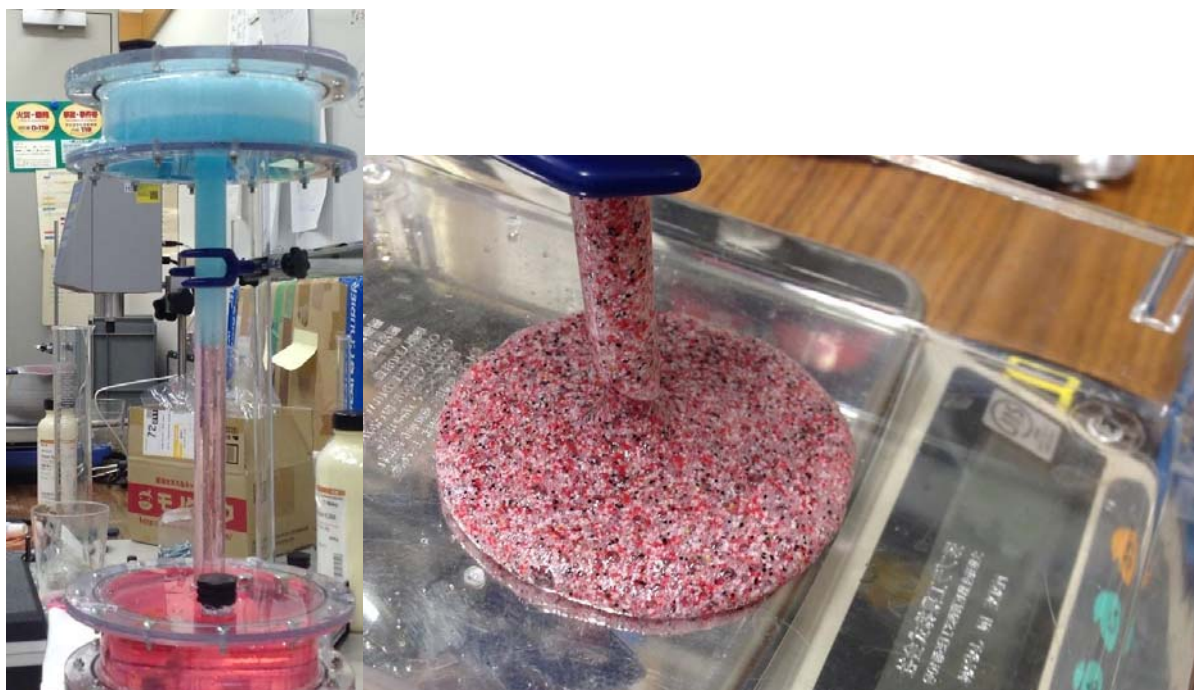
photographs of the Shinmoedake crater using an unmanned aerial vehicle (UAV). I then created a three dimensional topography dataset from the collected pictures. This surface allows us to look at the current shape of the dome and the crater rim.



- b) We went on a day trip to Izu-Oshima, where there are very interesting lava flows from the 1986 eruption. Oshima is expected to have another eruption in the next few years, and it is important to collect much data about current conditions.



- 3) **Lab experiments:** In collaboration with Prof. Atsuko Namiki at the Earth Science department, I performed a set of experiments looking at the influence of bubbles on magma flow in volcanic conduits and in lava domes. I learned how to set up experiments, prepare “magma” by mixing syrup, water, plastic particles and chemicals that make bubbles. I also practiced laboratory techniques for measuring viscosity and density of complex fluids.
- 4) **Presentations:** I gave three presentations about my research during my stay at ERI: one at Earth Science department (September 30th), one at NIED in Tsukuba (October 27th) and one at ERI (November 13th).



I expect to keep the collaboration with ERI scientists (specifically Maeno-san, Nakada-san and Ichihara-san) on the Shinmoedake project as well as other related projects. We are already discussing the possibility of a future visit to Izu Oshima, perhaps in the fall of 2015.

I greatly appreciate the opportunity to visit ERI and wish to thank all of ERI staff for making this visit extremely joyful. In particular I want to thank the staff of International Office, Yuka-san and Naomi-san, for their full support in every step of the visit.