

Strombolian eruption in a pot: Japanese curry vs. Italian tomato sauce

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It was when we discussed mechanisms of a Strombolian eruption with Dr. M. Ripepe at Stromboli Volcano Observatory, Italy. Emission of droplets and sound by a bubble bursting at the liquid surface became the topic. We discussed the phenomena on the analogy of our experience with cooking Japanese-style curry. On the other hand, Dr. Ripepe, who is an Italian with no such an experience, compared the magma with tomato sauce. Although the phenomena in the respective dishes in the pots are familiar to each of us, we barely understand the mechanism such as the location of generation and over-pressure of a bubble, generation and acceleration of droplets, and sound source. Moreover, it seems that the phenomena in the curry and in the tomato sauce are similar but quite different. In this study, we compare the phenomena in the two dishes, understand the mechanisms, and distinguish the differences.

As the first step, we cook typical Japanese curry and Italian tomato sauce in pots, respectively, and observe the surface phenomena and sounds. Quantitative measurements are conducted with a microphone in the air, pressure transducer in the dishes, and a high-speed video camera. The effects of mechanical properties of the liquids and presence of solid components are investigated systematically.