One of the possible mechanisms for generating the seismic mode “drumbeats” when moving the Kizimen Volcano viscous lava flow along the slope in 2011–2012

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Abstract “Drumbeats” is an unusual seismic mode consisting of volcanic micro-earthquakes with monotonous waveforms (multiplets) that are recorded from tens of minutes to months. Due to the quasi-regularity of the occurrence of earthquakes, the mode was called “drumbeats”. The “drumbeats” mode is registered when individual blocks are squeezed out on the extrusive domes of andesite and dacite volcanoes of the world and occurs at stable equilibrium states in the channel-magma system during an eruption. For the first time in the world practice of volcanological research, the “drumbeats” mode was registered, accompanying the movement of a viscous lava flow with a volume of 0.3 km^3 of the Kizimen volcano eruption in 2010-2013. The paper considers kinematic and dynamic parameters of micro-earthquakes of the “drumbeats” mode, their mechanisms, and offers a phenomenological model for generating the “drumbeats” mode that occurs when a lava flow moves along the slope of the Kizimen volcano.

Keywords Volcano, drumbeats, stick-slip, lava flow, hybrid earthquake, Kizimen, model.

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