



## **Seismic tremor associated with the degassing of the Gorely volcano in 2013-2014**

Sergey Abramenkov (1,2), Nikolai Shapiro (1,3), Ivan Koulakov (2,5), Ilyas Abkadyirov (3), William Frank (4), and Andrey Jakovlev (2)

(1) Institut de Physique du Globe de Paris, 1 rue Jussieu, 75238 Paris, France (abram.science@gmail.com), (2) Institute of Petroleum Geology and Geophysics SB RAS, 3 Akademichain Koptuyug Avenue, 630090, Novosibirsk, Russia, (3) Institute of Volcanology and Seismology, FEB RAS, 9 Piip Boulevard, 683006, Petropavlovsk Kamchatsky, Russia, (4) Department of Earth, Atmospheric, and Planetary Sciences, MIT, 77 Massachusetts Avenue 54-526, Cambridge, MA 02139, USA, (5) Novosibirsk State University, 2 Pirogova Street, Novosibirsk, Russia

We present observation of seismic activity associated with the strong degassing episode occurred in Gorely volcano (Kamchatka, Russia) in 2013-2014. We use the data of a temporary network of 21 broadband seismographs that operated on this volcano during one year. During the considered period, the volcanic activity mainly consisted of sustained gas emission that produced strong volcanic tremor well recorded by seismic stations. A close analysis of this tremor revealed that it was composed of many very frequent pulses of seismic energy. The corresponding signals had an emergent character without clear arrivals of P and S waves, which is typical for burst of Long Period (LP) events on many volcanoes. We developed a source-scanning algorithm based on summation of seismogram envelopes for automatic detection and location of these LP events. With the help of this method, numerous events originated from the vicinity of the main crater were detected. In a next step, we cross-correlated the waveforms of the detected LP events and found that a large part of them can be regrouped in families of seismic multiplets. This indicates that the increased pressure produced by the volcanic degassing activates a set of non-destructive shallow seismic sources in vicinity of the main volcanic conduit. The developed analysis of continuous seismic records was used to characterize the spatio-temporal evolution of these sources.