

A very long period seismic signal preceding a small phreatic explosion of Meakan-dake volcano, Hokkaido, Japan

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We found a strange very long period signal (duration ~60 seconds) in seismic record of a precursory swarm of small phreatic explosion at Meakan-dake volcano, Hokkaido, Japan, in 2006. The long period signal was very small, but considerable one-sided oscillation was contained in the velocity trace. Since such one-sided oscillation results from tilt change of seismometer, we interpreted the observed trace as a combination of rotational (tilt change) and translational motion (displacement change). Apparent displacement offset towards WNW direction indicates subsidence of ESE, which corresponds to azimuthal direction of summit crater of Meakan-dake volcano. We considered simple dual source model composed of deflating spherical source and expanding vertical elongated crack. Although this model may be too much simplified, waveform features in the observed seismic trace are well explained. This research may serve as a reference for the physical monitoring of small phreatic explosions and the interpretation of broadband seismic trace.