

EGU2020-6847

<https://doi.org/10.5194/egusphere-egu2020-6847>

EGU General Assembly 2020

© Author(s) 2020. This work is distributed under the Creative Commons Attribution 4.0 License.



Temporal changes of seismic velocity associated with a magmatic unrest of Changbaishan volcano, northeast China

Zhikun Liu

School of Geophysics and Information Technology, China University of Geosciences, Beijing, China (zkliu@cugb.edu.cn)

The observations of seismicity, ground deformation, and volcanic gas geochemistry indicate a magmatic unrest of the Changbaishan volcano, northeast China between July 2002 and July 2005. In this study, we collected the continuous waveform data from more than 10 stations of permanent and portable networks around Changbaishan volcano area from 2000 to 2018, and studied the temporal velocity changes beneath the volcano based on both the cross-correlation of station pairs and auto-correlation of single station method. We adopted the time-frequency domain phase weighted technique to speed up the convergence process of the noise-based Green's function, and improved the time resolution of monitoring from several tens of days to several days. We measured the temporal seismic velocity of the Changbaishan volcano in various frequency bands. The results shown that there were obvious seasonal changes of the seismic velocity for most frequency bands, and for 0.5-1 Hz frequency band a sudden velocity drop was observed starting on June 10, 2002 and the amplitude of velocity changes was up to 0.5%. After that, the number of volcanic events increased significantly. Our results suggest that there may be a precursory velocity drop phenomenon before the magma unrest, which is of great scientific significance for the studies of magma unrest and possible volcanic eruption in the future.