Volcanic atmospheric perturbation detected with barometer, broadband seismometer, and GNSS-TEC: comparison with ray-tracing calculation

*Yuki Nakashima[1], Kiwamu Nishida[1], Yosuke Aoki[1], Kosuke Heki[2]

1. ERI, Univ. Tokyo, 2. Space Geodesy Lab., Hokkaido Univ.

We investigate an atmospheric perturbation excited by the Kuchinoerabujima phreatomagmatic eruption that occurred at 0:59 UT on 25th May in 2015. It made an ionospheric perturbation, and we extracted the signal from GEONET 1 Hz sampling data by the GNSS-TEC method. The signal has a ~10 mHz N-shaped pulse and a ~5 Hz wave continuing about 15 min. These features are quite similar to ionospheric perturbation excited by the Asama volcano eruption in 2004 (Heki 2006; Chonan et al., 2017). We also found barometric disturbance in almost the same frequency band with barometers and broadband seismometers installed by NIED and AIST. We tried to explain all of the detected signals with ray-tracing calculation. In this presentation, we will introduce the results and discuss the features of the phenomena.

Acknowledgment
We thank the Geospatial Information Authority of Japan (GSI) for the GEONET RINEX data (ftp://terras.gsi.go.jp/), National Research Institute for Earth Science and Disaster Resilience (NIED) for F-net and V-net data, and National Institute of Advanced Industrial Science and Technology (AIST) for the barometers data.

Keywords: GPS, GNSS, Ionosphere, Volcanic eruption, GPS-TEC, GNSS-TEC

