Earthquakes Detectability of KUT Infrasound Sensor Network During 2019

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Infrasound waves can be defined as the sound waves with frequency range from 0.003 to 20 Hz. Kochi University of Technology (KUT) Infrasound Sensor Network contains 30 infrasound sensors which are distributed all over Japan, a large number of sensors are located in Shikoku Island, all infrasound stations installed with accelerometers to measure the peak ground acceleration (PGA) which can acquire information for seismic hazard assessment, Moreover it can be a good confirmation of infrasound sources especially the sources which occur on or under the ground like earthquakes. Furthermore, the infrasound propagation plays an important role in source detection.

Many infrasound sources detected by our network after establishing the network in late 2018. In this study we will focus on the infrasound detection and propagation of the large earthquakes which are located in Shikoku Island and are recorded in Reviewed Event Bulletin (REB) database of International Data Center (IDC) during 2019. Our recordings of PGA for these earthquakes are well compared with Kyoshin (K-NET) and Kiban Kyoshin (KiK-net) strong motion seismograph networks that are operated by the National Research Institute for Earth Science and Disaster Resilience (NIED) and available on web. Additionally Ground to Space Model (AVO-G2S) will be used with HWM-14 and NRL-MSISE to construct the atmospheric profile for higher altitudes up to 140 km over the event area, furthermore the ray tracing process will be addressed to study the infrasound propagation from the events to stations for reflected waves depending on the horizontal wind profile and the calculation of the effective sound speed.

In conclusion this study shows the earthquake detectability of the KUT Infrasound Sensor Network along Shikoku Island based on the integration between seismic and infrasound technologies by using the recorded data in accelerometers and studying the infrasound propagation for these events after building the atmospheric profile over each source.

Keywords: Infrasound, Seismic waves, Propagation, KUT Infrasound Sensor Network, Ray tracing, Detectability