[JJ] Evening Poster | M (Multidisciplinary and Interdisciplinary) | M-TT Technology & Techniques

[M-TT38]Brand-new scope of coupling geophysics being established by infrasound and associated waves

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Infrasound and associated wave studies are recently focused on coupling waves with long-distance and vertical propagation characteristics. Such kinds of waves, having with coupling process between the atmosphere and the surface of ground and ocean, are linked with elastic waves in lithosphere and oceanic sphere, as well as to atmospheric regions up to the upper atmosphere, playing a role of generating many kinds of wavelike turbulences in thermosphere. Moreover, whole on the globe, these waves excited depending on the latitude regions, as well as on the environmental regions, such as snow ice, desert, rainforest, mountain, ocean, etc., have their own characteristics. These waves can be excited by large-scale geophysical events like volcanic eruptions, tsunami, thunderstorms, etc. as well as artificial explosions, propagating with long distance. In this session, we would like to discuss such "coupling geophysics" by using many new or well-known investigated data and simulations of infrasound and associated low frequency waves. It can combine multiple spheres in geophysics and bring a brand-new scope of geophysics. Your contributions from many regions are welcome!

[MTT38-P03]Grid search method estimating wave source positions

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Infrasound is inaudible and low-frequency sound, which is lower than 20 Hz. It is enhanced by an occurrence of huge-scale events such as tsunami, typhoon, lightning, volcanic eruption and so on. Because of the very low frequency, the attenuation of infrasound by viscous energy dissipation and thermal conduction is negligible. Hence, this advantage enables us to catch distant events with the sound speed. Furthermore, it is expected to take advantage of disaster preventions.

In our laboratory, 15 units of infrasound sensors developed independently have been set widely distributed along Kochi coast since 2017. Such a wide distribution of infrasound sensors enables us to monitor and maintain data of a large-area at the same time. However, even if these sensors detect the huge-event signals, the precise time and direction for the occurrences are unknown. Hence, it is required to build a new model for analyzation and estimation of the wave source positions.

In this study, as one of the estimation method of wave source points, we introduce the grid search method which is familiar with seismology. To verify this method for the sound wave, we analyzed two months data containing the Mount Sakura-jima eruption events. As results, 53 events were detected, and it is found that the wave source positions for 38 of 53 events were estimated within around 6 km of the crater of the Mound Sakura-jima.