

インフラサウンド観測の現状と将来計画

山本 真行 [1]; 石原 吉明 [2]; 金尾 政紀 [3]; 鈴木 敏史 [1]; 戸田 茂 [4]
[1] 高知工科大・電子・光システム; [2] 国立天文台 RISE; [3] 極地研; [4] 愛教大・地学

Infrasound observation and its future plan

Masa-yuki Yamamoto[1]; Yoshiaki Ishihara[2]; Masaki Kanao[3]; Toshifumi Suzuki[1]; Shigeru Toda[4]
[1] Kochi University of Technology; [2] RISE, NAOJ; [3] NIPR; [4] Earth Sci., AUE

<http://www.ele.kochi-tech.ac.jp/masayuki/>

The infrasound is known as pressure wave whose frequency is lower than our lowest audible limit of 20 Hz. Since attenuation in low frequency range is not effective on propagation in atmosphere, the infrasound has a capability of long distance propagation. The application of infrasound measurement would be widely expanded because it can include the information of artificial explosion phenomena like nuclear bomb tests or large-scale chemical explosions as well as drastic geophysical events such as earthquakes, volcanic eruptions, meteorites, and thunder storms, coming far away from the observation sites, over a few thousands km distance.

In order to detect the direction of incoming infrasound waves, it is necessary to install a group of arrayed sensors per one observatory. We installed a few sensors at Uchinoura Space Center as well as one sensor at Syowa station. Preventing from high-costs (800,000 yen per one sensor) problem, we also developed a prototype of low-cost infrasound sensor with a capability of measuring sound waves in the frequency range from 0.01 Hz to 100 Hz (Nishiyama et al., 2007).

For the comparison and calibration of the both-type sensors, we measured the booming roar of three rocket launches during the flight period of the S-520-23 sounding rocket (on Sep. 2, 2007), the S-310-38 rocket (on Feb. 2008), and H2A-13 (on Sep. 14, 2007). Infrasound signals by rocket-engine burnings were successfully detected. In case of H2A launch, infrasound from Tanegashima to Uchinoura coming through 100 km distance was detected. There has a lot of advantages for investigating the propagation characteristics of infrasound in the atmosphere when we detect infrasound signals during certain periods of the rocket-engine burnings, because of given sound sources of the rocket in motion along their precisely calibrated trajectories with precise timing procedures. In the experiment, detection time and absolute intensity were investigated. At Syowa station, now we are checking surrounding environment for infrasound measurement there as a pilot observation. Another infrasound station will be built in near future in Japan.

In this paper, recent observations of infrasound in Japan and Antarctica as well as our future plan will be discussed.