

Development and test operation of small infrasound data loggers

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Infrasound, which is a low-pressure micro-pressure wave with a frequency of 20 Hz or less, has a characteristic that it is less susceptible for attenuation when propagating in the air and easily propagates over long distances. In 2019, Our Laboratory in Kochi University of Technology succeeded in producing a low cost and compact infrasound sensor by joint development with companies. The purpose of this research is to develop an infrasound data logger that is smaller and consumes less power than the conventional type or a laptop PC, and to operate the logger for a long period of time. Another objective is to develop a logger can that easily be deployed for observations, taking advantage of its small size. The developed logger saves the data observed by the small infrasound sensor (INF04LE) on the Raspberry Pi Zero, and has been in continuous operation in the laboratory since September 2019. In addition, we conducted a cold-area test in the Svalbard Islands, Norway for 15 days from November 24 to December 8, 2019 using the developed prototype loggers, and confirmed that data could be acquired normally. In the near future, we plan to design loggers with fixed point installation type loggers and temporary observation type loggers with different functions. Since the small infrasound sensor is a late-generation sensor, it is necessary to perform the observations in parallel with existing reference sensors and compare observation data of the same events. Therefore, it is necessary to perform the analysis at the timing when some large geophysical event occurs. In addition, we plan to develop a logger alive management and data graph display system. For the temporary observation type logger, we will further reduce power consumption and simplify the operation, aiming to data a data logger that anyone can handle easily in weak power supply condition.

In this study, we developed a prototype data logger for a small infrasound sensor. To date, a prototype has been developed and actually observed in test field. Since there are points for improvements, we plan to continue development and conduct long-term stable operation tests. Since there are improvements, we will continue to develop. A long-term stable operation test is also planned.

Keywords: Infrasound, Data logger