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Detection of microbaroms on icebreaker SHIRASE

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Microbaroms with about 0.2 Hz caused by oceanic wave are often observed as infrasound wave. We installed infrasound sensor and have observed small pressure variation since 2008 at the Showa station in Antarctica. The results show continues wave with about 0.2 Hz arrives from ocean area. Therefore, the wave is concluded with microbaroms excited at the Antarctic Ocean. However, the excitation mechanism of microbaroms has been still unknown enough because of lack of observation. To understand it, the infrasound sensor was installed on icebreaker SHIRASE and infrasound was observed from Fremantle, Australia during JARE-54 (54th Japan Antarctic Research Expedition) in 2012 and JARE-55 in 2013, and Harumi, Japan during JARE-56 in 2015 to offshore of the Syowa station. Although waves with similar frequency band of microbaroms was observed on the ship, pitch angle variation of the ship also had similar frequency. The pitch angle motion of the ship results vertical motion of the sensor, namely, pressure change. Rough estimation of vertical motion indicates that more than 50% of pressure change in microbaroms-band arises from vertical motion of the ship. In order to eliminate pressure change coming from microbaroms, accurate estimation of vertical motion of the ship is key issue. In this paper, we show attempt to detect microbaroms on the ship and preliminary results.

Keywords: infrasound, microbaroms, ocean wave, the Antarctic Ocean