東南極リュツォ・ホルム湾におけるインフラサウンド観測網の現状

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The Current Status of the Infrasound Observation Network at the Lützow-Holm Bay region, East Antarctica

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The characteristic features of infrasound waves observed in Antarctica reveal a physical interaction involving surface environmental variations in the continent and the surrounding Southern Ocean. A single infrasound sensor has been making continuous recordings since 2008 at Syowa Station (SYO; 69.0S, 39.6E) in the Lützow-Holm Bay (LHB) of East Antarctica. The continuously recorded data clearly show the contamination of background oceanic signals (microbaroms) throughout all seasons. In austral summer 2013, several field stations with infrasound sensors were established along the coast of the LHB. Two infrasound arrays of different diameters were set up: one at SYO (with a 100-m spacing triangle) and one in the S16 area on the continental ice sheet (with a 1000-m spacing triangle). In addition to these arrays, isolated single stations were deployed at two outcrops in the LHB. These newly established arrays clearly detected the propagation direction and frequency content of microbaroms from the Southern Ocean. Microbarom measurements are a useful tool for characterizing ocean wave climates, complementing other oceanographic and geophysical data from the Antarctic. In addition to the microbaroms, several other remarkable infrasound signals were detected, including regional earthquakes, and airburst shock waves emanating from a meteoroid entering the atmosphere over the Russian Republic on 15 February 2013. Detailed and continuous measurements of infrasound waves in Antarctica could prove to be a new proxy for monitoring regional environmental change as well as temporal climate variations in high southern latitudes.

南極で観測される特徴的なインフラサウンド波により、南極大陸と南大洋の表層環境変動に関連した物理相互作用が解明される。東南極昭和基地では、2008 年より単一センサーで連続観測が始まり、取得データには一年を通じて波浪による微気圧シグナル(microbaroms)が明瞭に記録された。2013 年夏にリュツォ・ホルム湾に複数の野外観測点が設けられ、2 種類の径のアレイが昭和基地（100m 間隔）と大陸氷床 S16（1000m 間隔）に、単一センサーが露岩域 2 か所に設置された。この新規アレイは南大洋の波浪シグナルの伝搬方向と周波数特性を明瞭に検知した。波浪シグナル測定は、他の海洋学・地球物理学データを補い、海洋波浪による気候変動を特徴づける上で有効である。波浪シグナルに加えて、局所地震やロシア南部の隕石爆発による衝撃波等が観測された。南極でのインフラサウンド連続測定は、南半球高緯度帯の気候変動と共に、地域的な環境変化をモニターする新たな指標となりうるであろう。