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ATMOSPHERE - OCEAN - SOLID EARTH INTERACTION FROM MICROSEISMS AND MICROBAROMS AT SYOWA STATION, ANTARCTICA

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Microseisms and microbaroms originated from the Southern Ocean are celarly recorded by both the broadband sesimograph and infrasound sensor deployed at Syowa Station (39E, 69S), East Antarctica. A continuous images are achieved for the double-frequency microseism / microbaroms (DFM) with peaks between 4 and 10 s during a whole season. The peak amplitudes of DFM reflect the large influence of winter extratropical cyclonic storms (brizzard) in the Southern Ocean. The DFM have relatively lower amplitudes during austral winters, caused by the larger amount of sea ice extent around the Lutzow-Holm Bay with decreasing the ocean wave loading effects. On the contrary, single-frequency microseism (SFM, with periods between 12 and 30 s) can be observable only by seismograph under excellent storm conditions particularly in local winter. On the infrasound data, moreover, long stand signals are identified with harmonic over tones at a few Hz to lower most human audible band. It probably related to the ice vibrations in the vicinity of the Station. Microseism measurements are a useful proxy for characterizing ocean wave climate and global storm intensity, complementing other estimates by ocean buoys or satellite measurements. A continuous monitoring both by broadband seismograph and infrasound observations firmly contribute to the Federation of Digital Seismographic Network (FDSN) and the Comprehensive Nuclear-Test-Ban Treaty (CTBTO) in southern high latitude, together with the Pan-Antarctic Observations System (PAntOS) under the Scientific Committee on Antarctic Research (SCAR).

Keywords: Syowa Station, Microseismic Noise, Infrasound Microbaroms, ocean wave climate, atmosphere-ocean-solid earth system