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Evaluating microbaroms source models in finite ocean depth: comparison with IMS station observations

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The global International Monitoring System (IMS) network continuously detects coherent ambient infrasound noise between 0.1 and 0.5 Hz. This noise, referred to as microbaroms, is generated by second order non-linear interaction of ocean waves, mostly during severe storms. A global and multi-year analysis of microbarom arrivals highlights the strong influence of middle atmospheric conditions on the propagation. Various source models have been developed in earlier works; e.g., Brekhovskikh et al. (1973) and Ardhuin & Herbers (2013) who considered a source directivity effect in infinite depth ocean with the radiative pressure depending on the wave elevation angle. Waxler & Gilbert (2006) and Waxler (2007) investigated the radiation of infrasound by ocean waves in finite depth ocean from monopolar sources. The current study compares the output from these models in order to assess the relative importance of the physical mechanisms accounted for. Comparing the observed and modeled directional microbarom amplitudes at the IMS station IS37 in Norway helps to further evaluate the relative contributions of the different source mechanisms involved such as bathymetry and source directivity effects.