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Characterizing ocean ambient noise using a regional infrasound network

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The ability of the International Monitoring System (IMS) global infrasound network to detect atmospheric explosions and events of interest strongly depends on station specific ambient noise signatures which include both incoherent wind noise and real coherent infrasonic waves. To characterize the coherent ambient noise, broadband array processing was performed on 10 years of continuous IMS recordings. Ocean wave interactions contribute to the atmospheric coherent ambient noise field, and we apply wave action models to model these microbarom sources. To further evaluate oceanic wave action models at regional scales, infrasound analyses are supplemented using data from several experimental arrays on the Scandinavia peninsula. We use two-dimensional energy spectrum ocean wave products to build a multi-year reference database of oceanic noise sources in the North Atlantic. Then we compare observed and modeled directional microbarom amplitudes at several stations. The expected benefits of such studies concern the use of multi-year complementary data to finely characterize the coupling mechanisms at the ocean-atmosphere interface. In return, better knowledge of ambient ocean noise sources opens new perspectives not only by enhancing the characterization of explosive atmospheric events, but also by providing additional integrated constraints on middle atmosphere dynamics and disturbances where data coverage is otherwise sparse.