Distribution of long period seismic "hum" sources following large storms in the north Pacific and their relation to infragravity waves

Satish Maurya[1,2], *Taka'aki Taira[1], Barbara Romanowicz[1,3]

1. Berkeley Seismological Laboratory, University of California, Berkeley, 2. Department of Earth Sciences, Indian Institute of Technology Bombay, 3. Collège de France, Paris

The earth's low frequency "hum" originates primarily in the oceans and is generated through interaction of infragravity waves with the seafloor. The infragravity waves themselves are produced by non-linear interaction between ocean waves generated by storms. We investigate the spatially and temporally varying distributions of sources of the Earth's low-frequency seismic hum at high space-time resolution during a seismically quiet 7-day period in December 2015 in which two large storms with different reaches propagate across the North Pacific Ocean. Our beamforming and array analyses obtained for a Cascadia storm are consistent with the conceptual model of Rhie and Romanowicz (2006, G-Cubed) in which sources of seismic hum are generated progressively, as infra-gravity waves propagate away from the impact location of the storm on the west coast of North America, along the coast and toward the open ocean. Our result suggests that the distribution of Earth's hum sources strongly depends on the propagation characteristics of the corresponding storms. We discuss these results in the light of more recent data (winter of 2018-2019) during which the dense AACSE (Alaska Amphibious Community Seismic Experiment) was deployed off-shore Alaska together with on-shore USArray broadband stations in Alaska, providing the opportunity to investigate the relationship of Pacific storms and "hum", as recorded on offshore buoys, absolute/differential pressure gauges and broadband seismometers together with land-based broadband seismic arrays in Alaska and California.

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