



ID: O1.1-531

Type: Oral

microbarom patterns: infrasound ambient noise modelling vs IMS observation database

Wednesday 30 June 2021 17:20 (15 minutes)

Microbarom signals are generated by wind-waves at the ocean surface and propagate all around the globe through the stratosphere and ionosphere. Microbaroms dominate the coherent infrasound ambient noise measured anywhere on Earth, with a particular peak for periods around 5 s. This ubiquitous signal can be used to monitor the medium in which it propagates, allowing to probe the properties of the middle atmosphere. Here we show the first quantitative validation of global microbarom modelling using a new source model, an ocean wave model, and atmospheric attenuation parameterization. The modelling results are compared to a reference database of microbaroms detected by the global infrasound International Monitoring System over seven years to evaluate the influence of ocean waves, source and propagation parameters. This study demonstrates that the new source model performs better than previous models, and is best when this model is combined with a wind-dependent attenuation and an ocean wave model that includes coastal reflection. Better knowledge of ambient ocean noise sources opens new perspectives to enhance the characterization of explosive atmospheric events, and provides additional integrated constraints on middle atmosphere dynamics.

Promotional text

This study main outcome is a first global and quantitative validation of a new microbarom source model. New perspectives arise from coupling this source model with refined propagation models in order to enhance coherent noise characterization and assess middle atmospheric models.

Primary author: Ms DE CARLO, Marine (Centre National de la Recherche Scientifique (CNRS), France)

Co-authors: Mr LE PICHON, Alexis (Commissariat à l'énergie atomique et aux énergies alternatives (CEA), France); Mr HUPE, Patrick (Federal Institute for Geosciences and Natural Resources (BGR), Hannover, Germany); Mr CERANNA, Lars (Federal Institute for Geosciences and Natural Resources (BGR), Hannover, Germany); Mr ARD-HUIN, Fabrice (Institut Français de Recherche pour l'Exploitation de la Mer, France)

Presenter: Ms DE CARLO, Marine (Centre National de la Recherche Scientifique (CNRS), France)

Session Classification: T1.1 - The Atmosphere and its Dynamic

Track Classification: Theme 1. The Earth as a Complex System: T1.1 - The Atmosphere and its Dynamic