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Interactions between intermittent gravity waves and infrasounds
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— Even though the accuracy of atmospheric specifications is constantly improving, it is well known that the main part of gravity waves is still yet not resolved in the available data. In most infrasound modeling studies, the unresolved gravity wave field is often represented as a deterministic field that is superimposed on a given average background state. Direct observations in the lower stratosphere show, however, that the gravity wave field is very intermittent, and is often dominated by rather well defined wave packets. In this study we sample the gravity wave spectrum by launching few monochromatic waves and choose their properties stochastically to mimic the intermittency. The statistics of acoustic signals are computed by decomposing the original signal into a sum of modal pulses. Owing to the disparity of the gravity and acoustic lengthscales, the interaction can be described using a multiplescale analysis and the appropriate amplitude evolution equation involves certain random terms that are related to the gravity wave sources. More specifically, it is shown how the unpredictable low level small-scale dynamics triggers multiple random stratospheric waveguides in which high frequency infrasound components can propagate efficiently.

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