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# of Gravity Wave Induced Small Scale Perturbations in the Atmosphere on Infrasound Arrival Times at a High Altitude Floating Sensor System

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In recent years, high altitude floating platforms with a microbarometer payload have been utilized towards infrasound detection and source characterization. The stratospheric locale is presumed to be less noisy, thus facilitating better signal detection compared to ground based sensors. High altitude sensing platforms are also considered the future of space exploration for extraterrestrial worlds with harsh atmospheres and lack of surfaces. A high altitude balloon carrying a sensor payload was launched in the early morning on 10 July 2020, with the aim to capture infrasound generated by a series of three controlled ground explosion experiments carried out in New Mexico, USA. All three events were detected. During the first two events, the balloon was in the close proximity of the explosion epicenter (<50 km), well within the acoustic zone. However, at the onset of airwave arrival from the third event, the balloon was at the edge of the acoustic shadow zone, where no signal detection is predicted. Gravity wave induced small scale structures in the atmosphere are known to have a notable influence on infrasound propagation. We discuss this effect in the context of high altitude infrasound sensing and event characterization at regional distances. SNL is managed and operated by NTESS under DOE NNSA contract DE-NA0003525.

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Promotional text

This work includes a contribution relevant to the effect of small scale perturbations on infrasound propagation in the context of high altitude sensing platforms that provide a unique vantage point for detection and characterization of acoustic sources.

Oral preference format

pre-recorded video

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