

infrasound: A new way to explore the 3D acoustic wavefield

As a part of the Source Physics Experiment (SPE) site characterization and explosive test series, we developed and deployed an airborne octocopter infrasound platform. Traditionally, infrasound data is collected with sensors and arrays that are installed on the ground. For most applications this is sufficient but can be limiting when observing non-isotropic sources, such as underground explosions, at close range. To develop and test the airborne infrasound platform we recorded data from the HK Exploration Seismo-Acoustic Hammer at the Nevada National Security Site. During early field-testing of the hammer source we found that, as the 13 metric ton mass hit the ground, a significant downward deflection of the surrounding surface imparted an observable infrasound pressure wave into the atmosphere. We compared waveforms collected at various vertical and horizontal offsets from the hammer source and found that the peak frequencies differed when observed directly above the source compared to the horizontal offsets. This work was done under award number DE-AC52-06NA25946. Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

Primary author: JONES, Kyle (Sandia National Laboratories)

Presenter: JONES, Kyle (Sandia National Laboratories)

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