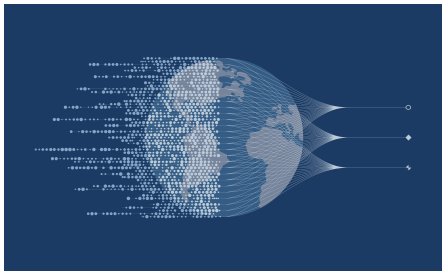

ID: **P1.1-228** Type: **E-poster**

# of anomalously fast infrasound phases from global bolide events

Anomalously fast infrasound phases, with unexpectedly high celerities, present a challenge for accurate modeling and detection of atmospheric events over long distances. While fast arrivals are typically confined to short-range propagation (within 300 km) where boundary layer effects are dominant, recent observations reveal celerities exceeding 330 m/s at ranges spanning thousands of kilometers. To understand the cause of these early arrivals, we analyze a dataset of 172 bolide events, using information from United States Government sensors in the NASA JPL CNEOS database and global infrasound detections reported in the literature. Each event includes detailed infrasound parameters, arrival times, and celerities, allowing us to systematically compare observed speeds with theoretical predictions across various atmospheric waveguides. Our findings suggest that these fast arrivals may result from specific propagation effects, such as narrow stratospheric ducts or favorable downwind conditions that enhance signal speed over long distances. By incorporating bolide-specific parameters, this study aims to advance the infrasound monitoring capabilities of the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization, improving detection and characterization of both natural and anthropogenic atmospheric events on a global scale.
SNL is managed and operated by NTESS under DOE NNSA contract DE-NA0003525.

E-mail

esilbe@sandia.gov

In-person or online preference

Primary author: Dr SILBER, Elizabeth (Sandia National Laboratories (SNL))

Co-authors: Mr PILGER, Christoph (Federal Institute for Geosciences and Natural Resources (BGR)); Mr RONAC GIANNONE, Miro (Sandia National Laboratories (SNL)); Ms CZARNOWSKI, Summer; Mr SAWAL, Vedant (Sandia National Laboratories (SNL))

Presenter: Dr SILBER, Elizabeth (Sandia National Laboratories (SNL))

Session Classification: P1.1 The Atmosphere and its Dynamics

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