



## **A Markov Chain Monte Carlo Algorithm for Infrasound Atmospheric Sounding: Application to the Humming Roadrunner experiment in New Mexico**

Jean-Marie Lalande (1), Roger Waxler (1), and Doru Velea (2)

(1) National Center for Physical Acoustics, University of Mississippi, United States (jeanmarie.lalande@gmail.com), (2) Leidos, Reston VA, United States

As infrasonic waves propagate at long ranges through atmospheric ducts it has been suggested that observations of such waves can be used as a remote sensing techniques in order to update properties such as temperature and wind speed. In this study we investigate a new inverse approach based on Markov Chain Monte Carlo methods. This approach as the advantage of searching for the full Probability Density Function in the parameter space at a lower computational cost than extensive parameters search performed by the standard Monte Carlo approach. We apply this inverse methods to observations from the Humming Roadrunner experiment (New Mexico) and discuss implications for atmospheric updates, explosion characterization, localization and yield estimation.