



ID: O1.1-143

Type: Oral

## the correlation between wind noise levels and topography for wind noise mapping and site selection

Turbulent pressure fluctuations around infrasound sensors, known as wind noise, are the primary factor masking infrasound detections of interest, such as signals generated by natural hazards. Identifying deployment sites with sufficiently low wind noise levels is crucial for achieving good signal to noise ratios. Noise levels are expected to correlate with local topography, which influences wind flow patterns and turbulence. This study investigates the relationship between wind noise levels and topographic features to support wind noise mapping and optimal sensor site selection. Wind noise data were collected from multiple test sites and analysed in two frequency bands: 0.1–1 Hz and 1–10 Hz. RMS pressure levels were calculated for each band, and Kernel Density Estimation was applied to estimate probability density functions. The associated cumulative distribution functions provide the probability of noise levels falling below specific thresholds, offering a statistical characterization of wind noise at each site. Topographic data were derived from remote sensing techniques, including LiDAR and satellite imagery, to analyse ground elevation, vegetation density, and canopy height. A framework for understanding wind noise behavior across varying topographic conditions, supporting the development of effective methodologies for wind noise mapping and site selection, is developed.

### E-mail

mnetode@go.olemiss.edu

### In-person or online preference

**Primary authors:** Ms JESUS, Céu (University of Mississippi); Mr WAXLER, Roger (National Center for Physical Acoustics (NCPA), University of Mississippi); Mr HETZER, Claus (National Center for Physical Acoustics (NCPA), University of Mississippi); YARBROUGH, Lance (University of Mississippi); Mr TALMADGE, Carrick (National Center for Physical Acoustics (NCPA), University of Mississippi); BUCHANAN, Hank (National Center for Physical Acoustics (NCPA), University of Mississippi); THIRUNILATH, Naveen (National Center for Physical Acoustics (NCPA), University of Mississippi)

**Presenter:** Ms JESUS, Céu (University of Mississippi)

**Session Classification:** O1.1 The Atmosphere and its Dynamic

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