

**Title: Observations of anthropogenic acoustic waves in the stratosphere**  
**Session: Innovative seismo-acoustic applications to forensics and novel monitoring problems**

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Microbarometers on high altitude balloons experience a very low noise environment that allows them to capture very faint acoustic signals. Here, we report observations of wind turbine and aircraft generated infrasound from balloon flights in New Mexico and Arizona.

Wind turbines generate a set of harmonics in the high infrasound/low audio range.

They are barely discernable from background noise in spectrograms, but this appears to be a function of the instrument noise floor rather than high levels of ambient sound.

Several aircraft Doppler signatures were also observed, but their rarity is rather surprising given the variety of traffic beneath the flight regions.

We model the spectrogram traces of direct and ground-reflected aircraft Doppler signatures observed in the stratosphere and compare our observations with these synthetic results.

We suggest that airborne acoustic sensors may be more effective than ground based ones for detecting and locating both surface and free flying sound emitters, but that further instrumentation development is necessary to realize the full potential of this method.