

## Objectives

### Part A: Certification Standards

- Remove turbulence effects from supersonic signature measurements for aircraft certification
- Support the development of international standards for low boom supersonic flight

### Part B: Assess Community Impact

- Finalize low cost noise monitor(LCNM) prototype
- LCNM will optimize measurements and minimize costs
- Conduct literature review on environmental masking
- Consider differences in perception in urban vs. rural areas

## Methods and Materials

### Part A: Certification

- Investigate deturbing and signature estimation methods.
- Future plans to explore signature identification using audio fingerprinting algorithms. Algorithms are used by music matching applications such as Shazam.

### Part B: Impact

- Conduct LCNM prototype testing with Volpe
- Gather and summarize environmental literature findings

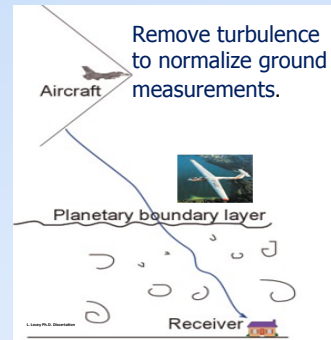


LCNM Components
2 Microphones
GPS Sensor
Environmental Sensor
Accelerometer Sensor
Single Board Computer (SBC)

## Summary

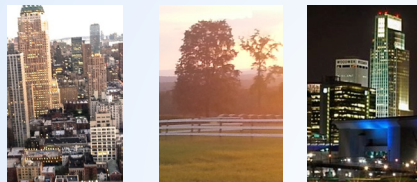
### Part A: Certification

Supersonic aircraft certification is complicated by changes in ground measurements due to turbulent atmospheric conditions.



### Part B: Impact

Investigate acceptability of low booms through noise measurements and by identifying methods used to assess noise perception in varying background noise environments. This effort supports comparisons of impact across rural and urban communities.

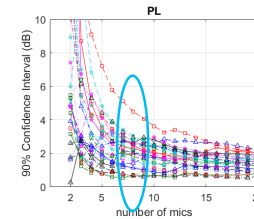


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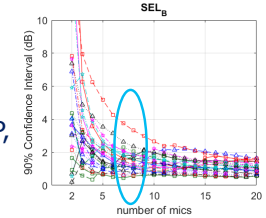
## Results and Discussion

### Part A: Certification

Fewer than 10 adjacent mics needed for stable 90% confidence interval



Out of  $SEL_A$ ,  $SEL_B$ ,  $SEL_E$ , PL, and ISBAP,  $SEL_B$  has the lowest variation



### Part B: Impact

- LCNM design utilizes commercial off the shelf (COTS) parts
- Can capture low level signals and higher dynamic signals
- Applicability for a range of noise monitoring projects

- Environmental masking review initiated
- Evaluate analysis methods for perception of continuous aviation noise and perception of low boom impulsive noise

## Conclusions and Next Steps

Continued efforts on certification and impact will advance findings on community acceptability of low boom signatures. These efforts align with CAEP/WG1/SSTG, FAA and NASA supersonics initiatives.

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