3rd AIAA Sonic Boom Propagation Workshop

FAA evaluation of sBoom (Version 2.80) - User's Summary

Presented to: 3rd AIAA Sonic Boom Propagation Wkshop

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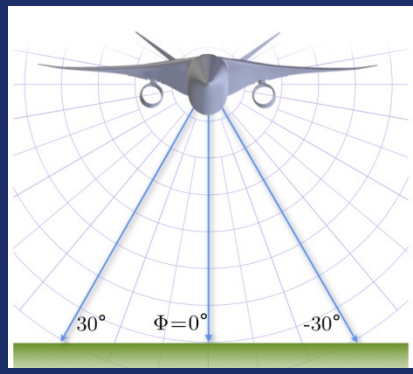
Federal Aviation Administration

Aim of Super Sonic Task Group (SSTG)

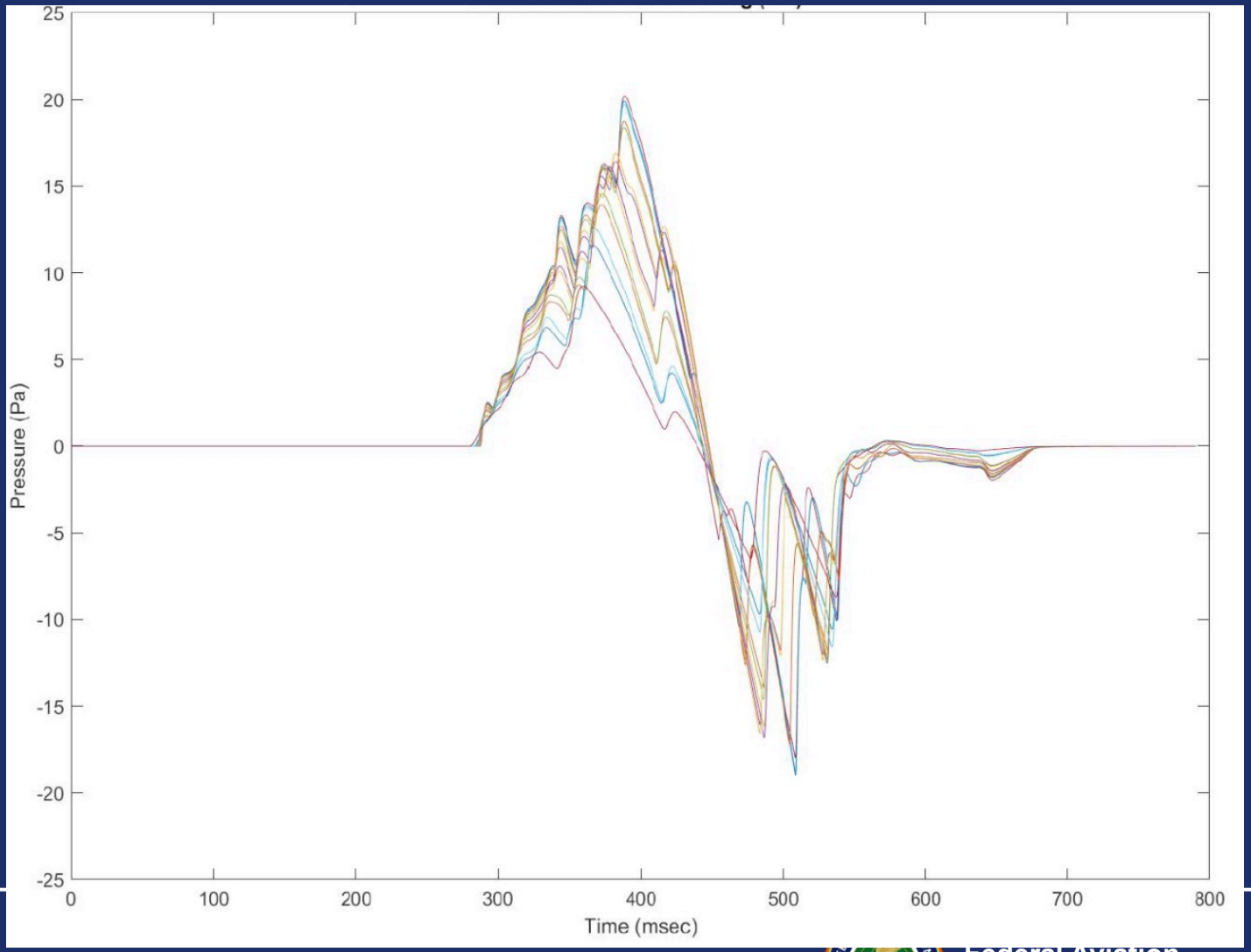
- Task to define a noise certification standard for supersonic airplanes en route above Mach 1 speeds.
- Developing a standard to provide industry technical guidance on the expectation of noise certification testing and measurements that addresses sonic boom.

About sBoom

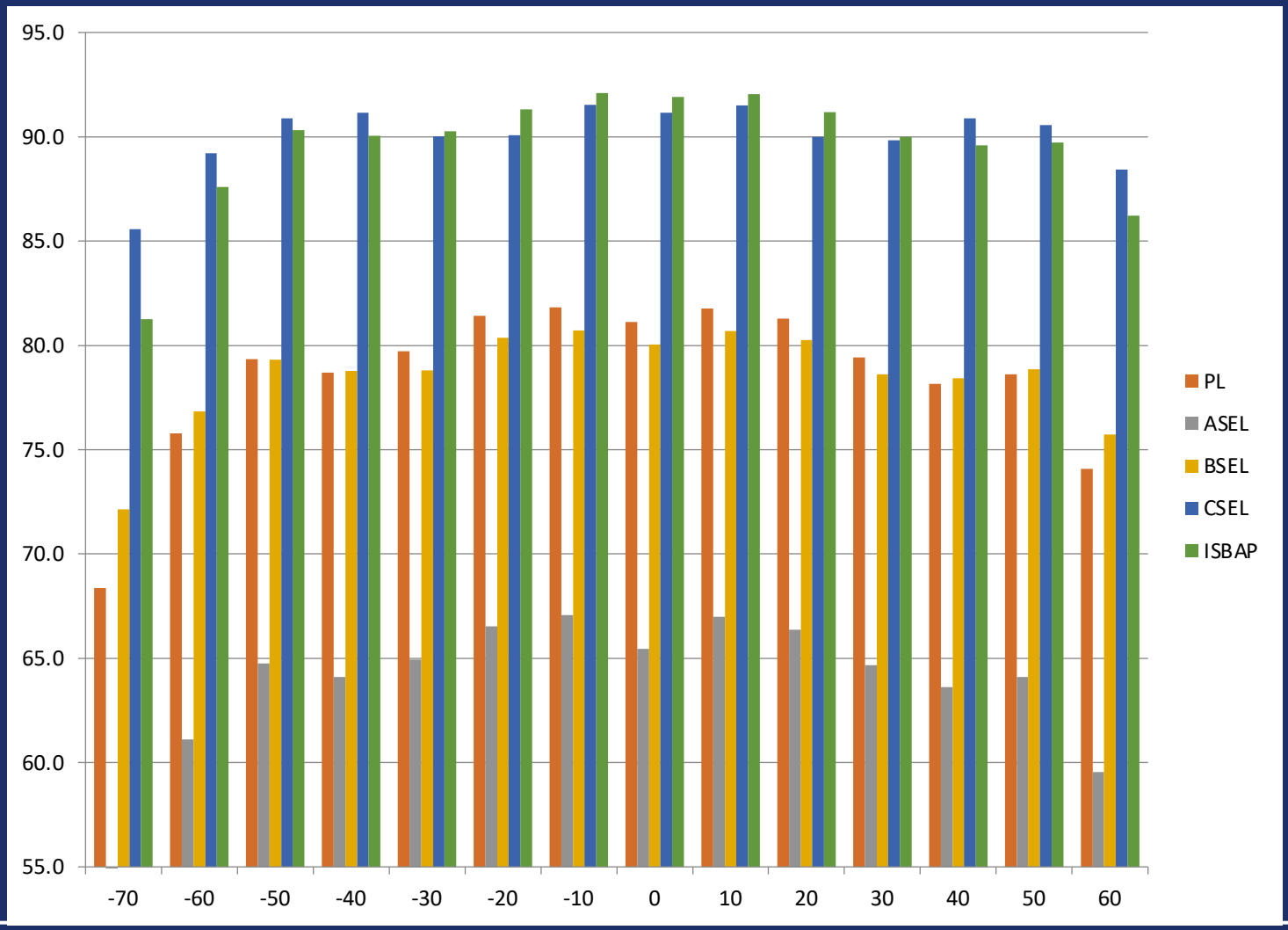
- **Originally based on the THOR code by Cleveland.**
  - Can handle three different types of inputs for source.
  - Can handle wind profiles.
  - Capable of user input atmospheres including temperature and relative humidity effects
  - Prediction of off-track signatures
  - Prediction of ground intersection with aircraft location as well as shock rise times.



CASE 1: Azi -70 deg to +60 deg



Case 1: Noise metrics



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Mistakes made

- Initially overlooked in adjusting prescribed wind measures for sBoom wind convention.

  [sBoom y-axis wind = (-) measured y-axis wind]
- Did not follow the exact template specified azimuth (since ran into PC computer overload). Tried to run fewer and odd increments.
- Did not recognize new feature upgrade for wind inputs – Flag #4 (mean flow inclusion). Tried Flag #4 and crashed due to MS OS issue.

User Recommendations of Code(s)

- **Flexibility to switch between output conventions (metric-Pa vs US units-psi)**
- **Update sBoom user guide documentation for:**
  - latest improvements - more about Wind flag #4
  - include clarification on wind conventions
- **Include:**
  - ISBAP metric computation option
  - E-SEL metric computation option

Acknowledgement

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- AIAA Sonic Boom Propagation Workshop organizers