

Custom Muffler Design (AM)²

For the University of Idaho Clean Snowmobile Challenge Team

Problem:

To reduce sound and emissions in 2-stroke snowmobiles through the implementation of a custom muffler.

Project Goals:

- **QUIET:** Meets NPS Standards (67 ± 2 dBA) in J1161 sound Test
- **CLEAN EMISSIONS:** E-score of 180 + with Catalyst implementation
- **PERFORMANCE:** Similar back pressure with robust design
- **PACKAGING:** Fits in competition chassis, cost effective solution

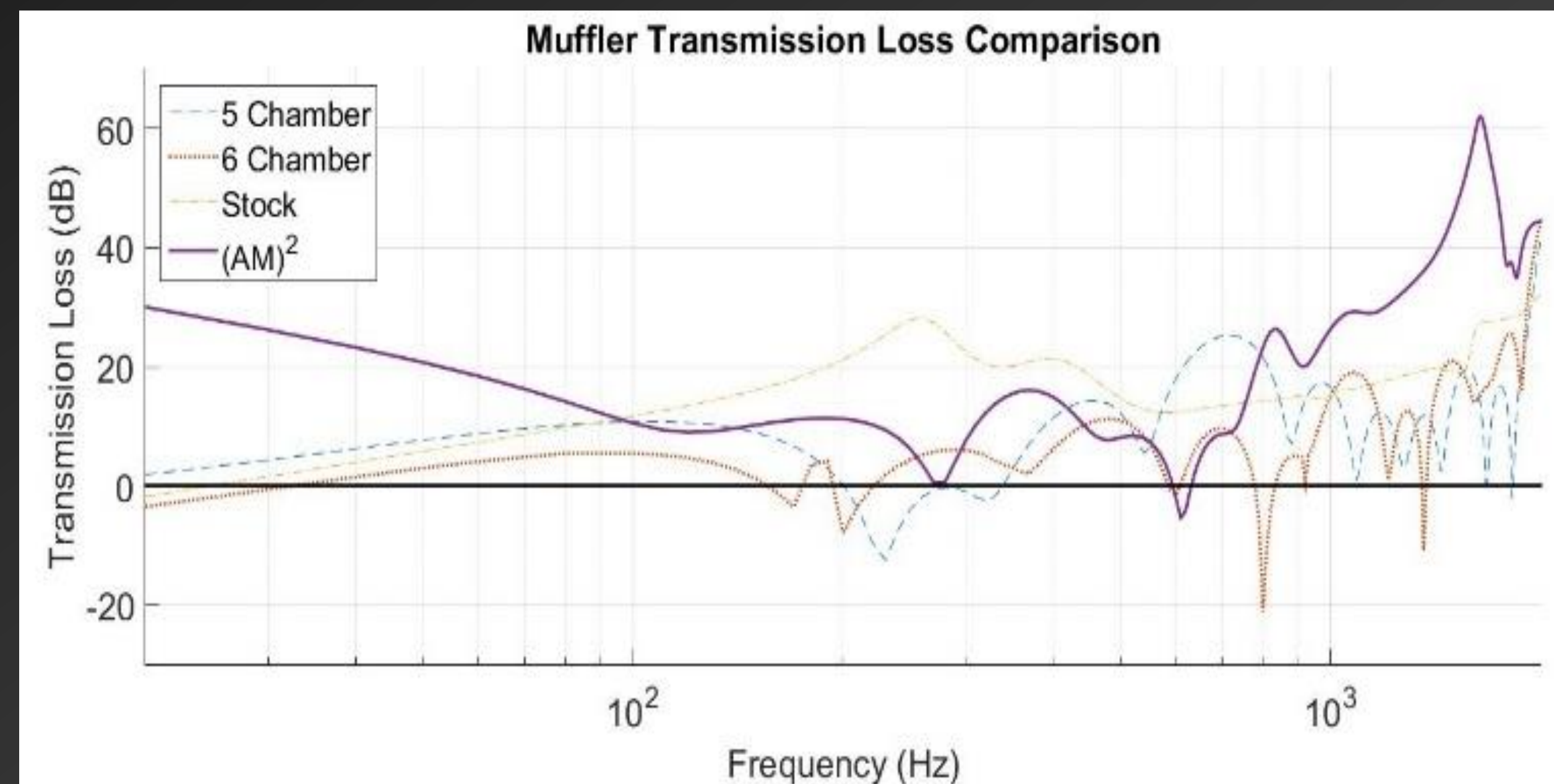


Silent Nightmare

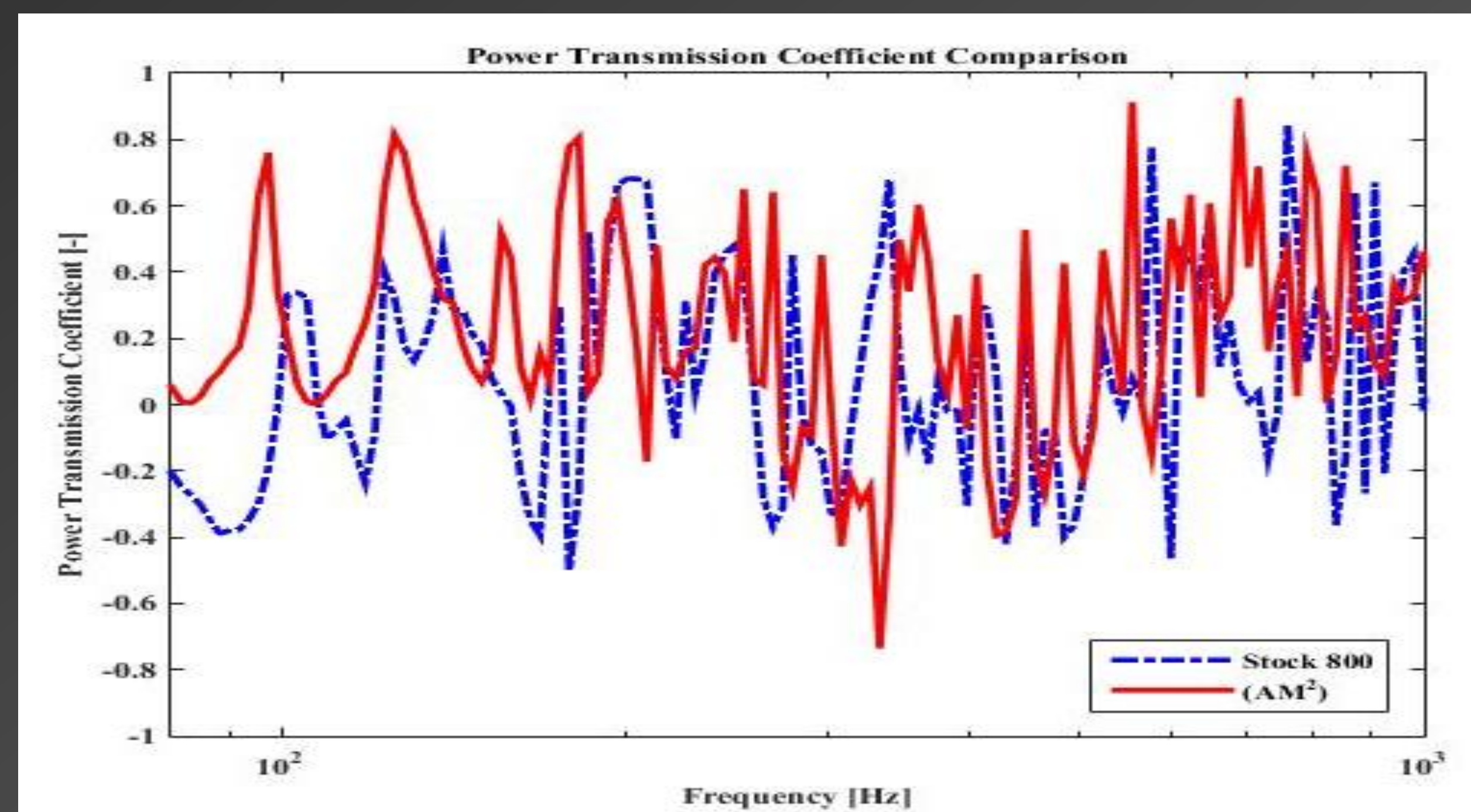
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Acoustic Results

Sidlab: 1-D Acoustic Simulation

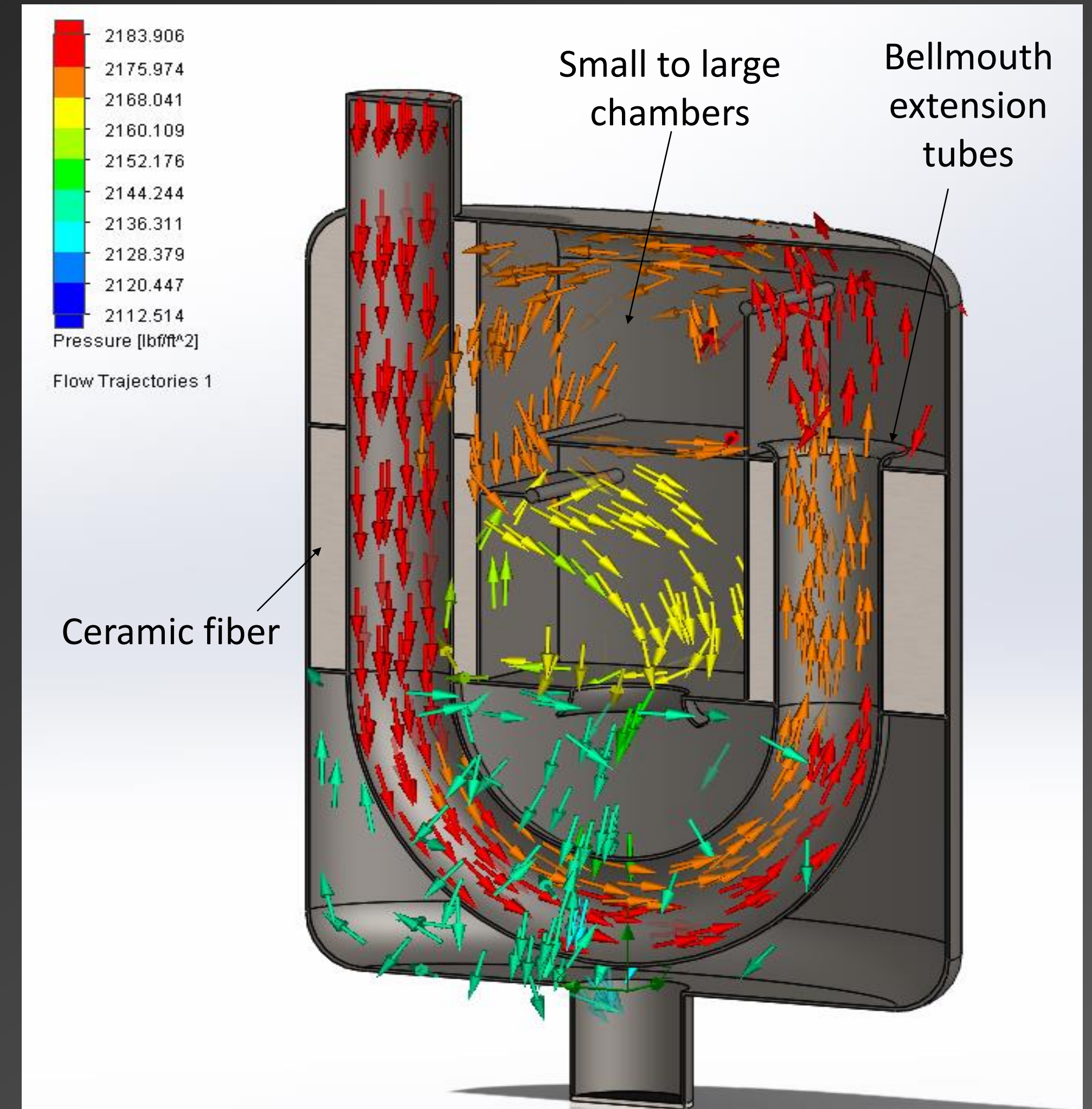


Final Muffler vs Stock



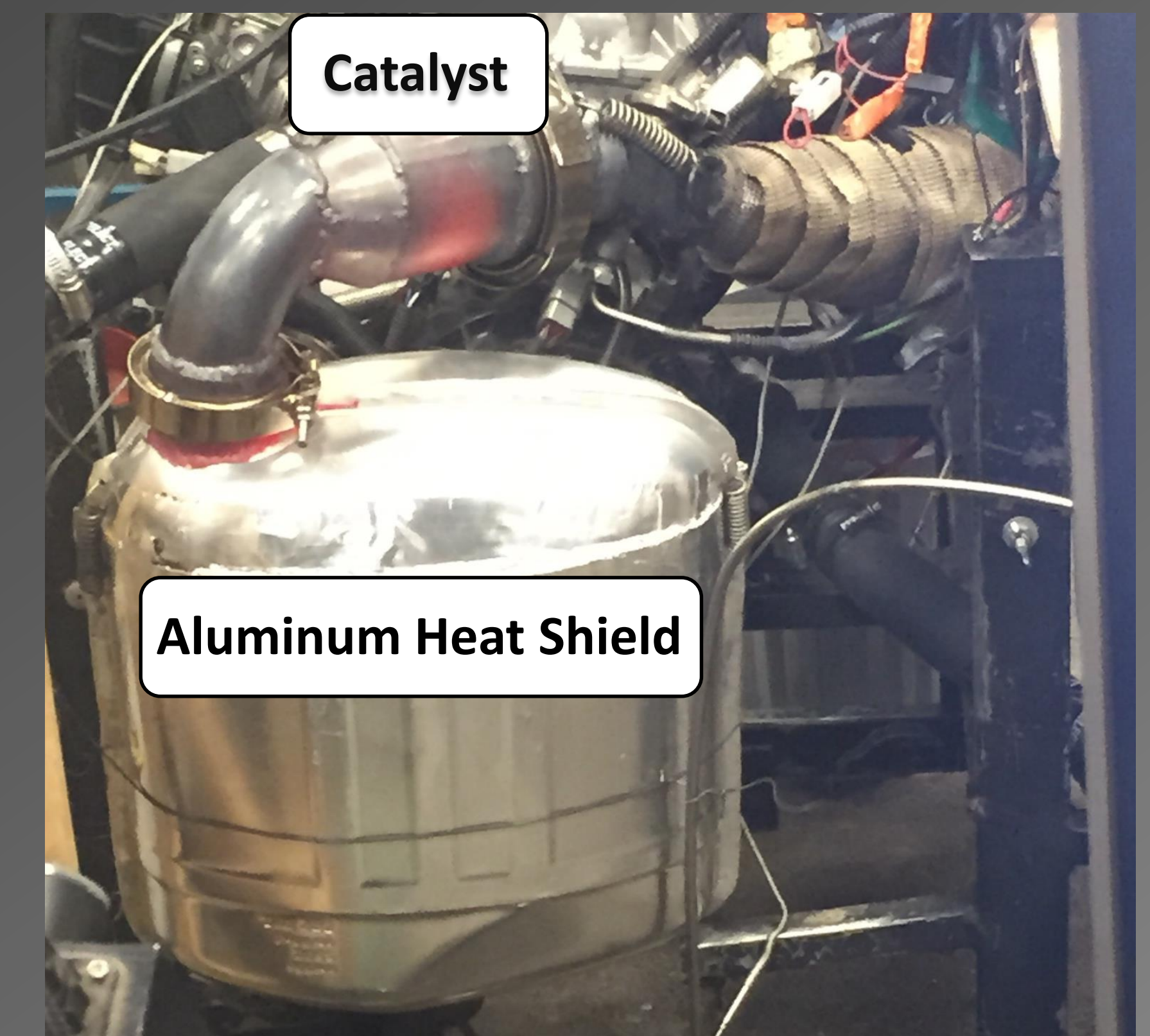
1 = All sound attenuated. 0 = no change. -1 = sound gain

Simulation



SolidWorks flow: Predicts backpressure

Finished Product

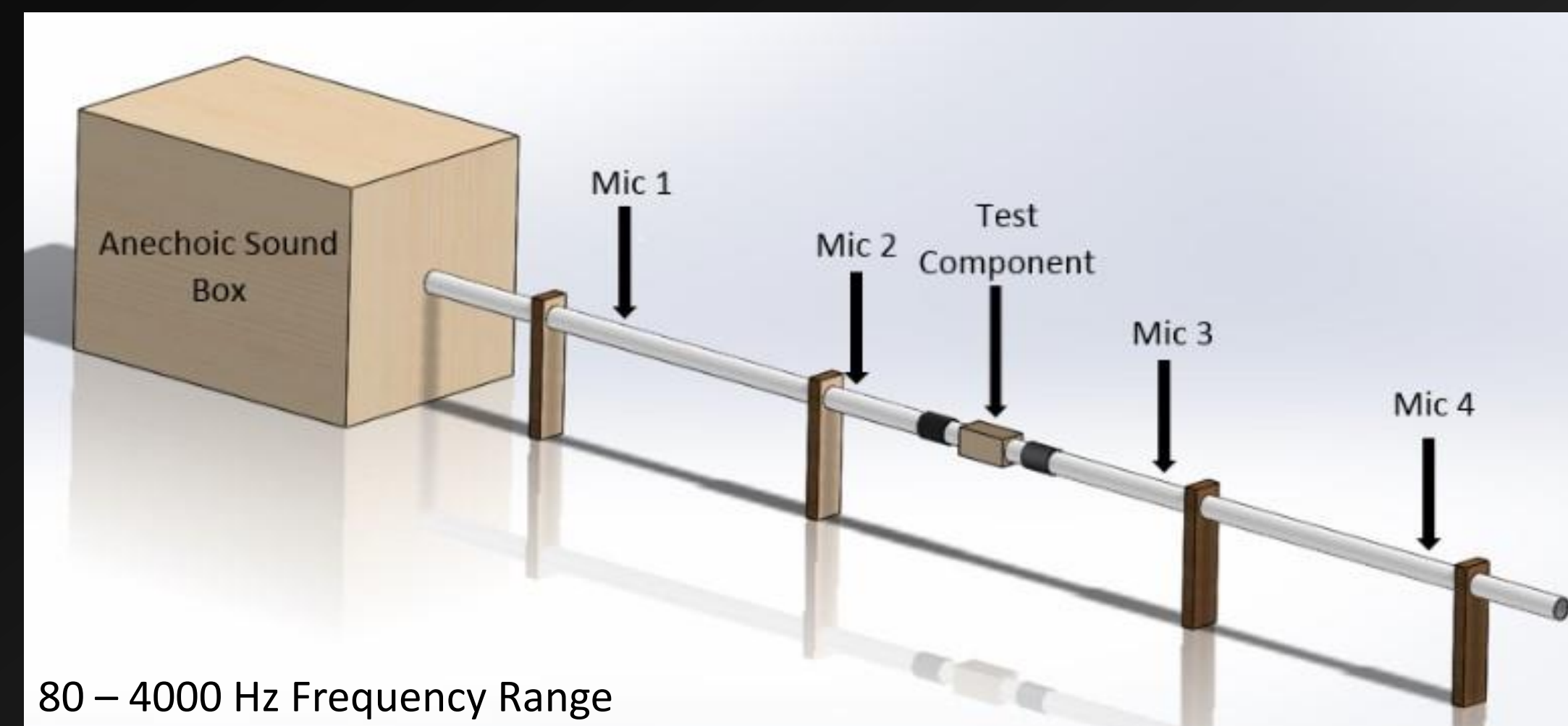


Competition Results

- Met NPS Standards – 5 dBA lower than control sled
- Placed as 3rd quietest out of 14 competing teams

Testing Apparatus

Sound Box – Measures Sound Reduction



Back-Pressure Results

Flow Bench - Measures Flow Resistance

Configuration	Back Pressure	Change from Stock
Stock	.043 bar (.63 psi)	0%
2016 Configuration	.050 bar (.73 psi)	16%
(AM) ²	.052 bar (.76 psi)	21%
(AM) ² With Catalyst	.066 bar (.96 psi)	52%

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