2021 ASCENT Annual Advisory Board Review

Jet Noise Modeling to Support Low Noise Supersonic Aircraft Technology Development

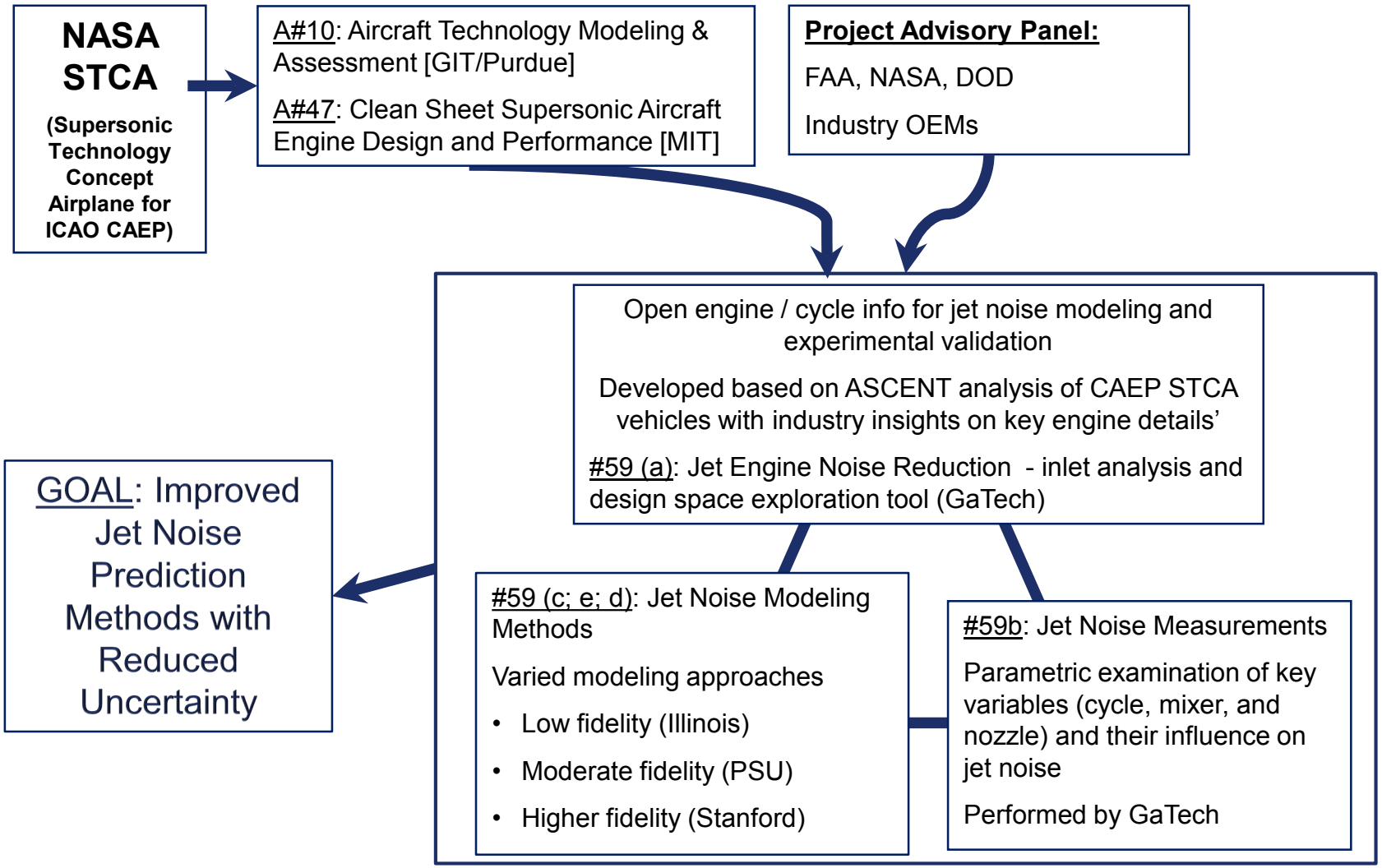
Federal Aviation Administration

Presented to: ASCENT Community

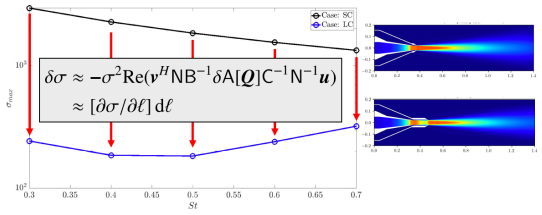
By: Sandy Liu & Muni Majjigi FAA (AEE-100)

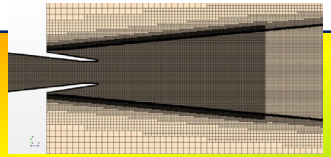
Date: October 27, 2021

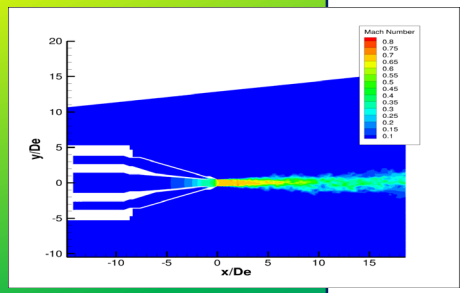
Jet Noise Modeling to Support Low Noise Supersonic Aircraft Technology Development



SPECTRUM OF ANALYTICAL METHODS for VALIDATION with measured experimental data







Resolvent Modes

(U of Illinois)

Quick Runs/ Moderate CPU/ Trends Fidelity

RANS CFD + FWH

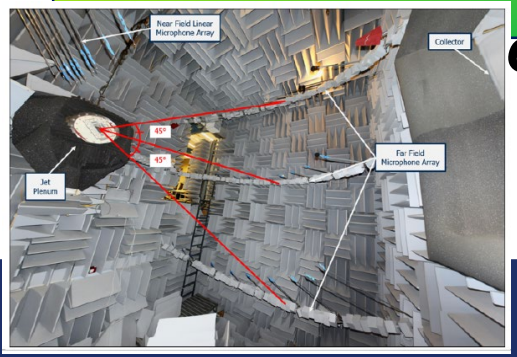
(Penn State U)

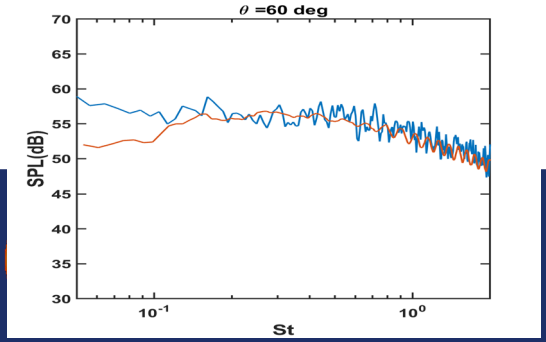
Long Runs/ Intensive CPU/ Detailed Fidelity

LES-RANS CFD

(Stanford U)

VALIDATION with measured experimental data (by Georgia Tech)





2021 ASCENT Advisory Brd mtg – speaker order

- **Overview Supersonic Aircraft Jet Noise Research (Sandy Liu) 3min**

<u>Jet Design</u>:

- **#59A: Jet engine noise reduction– GIT (Jimmy Tai) – 6min**

<u>Reduction Methods</u>:

- **#59C: Modeling supersonic jet noise reduction with global resolvent modes- U of Illinois - (Daniel J. Bodony)– 12min**
- **#59E: Moderate fidelity simulations for efficient modeling of supersonic aircraft noise- PSU (Philip J. Morris)- 12min**
- **#59D: Multi-fidelity modeling for supersonic aircraft exhaust noise- Stanford U (Sanjiva K Lele) – 12min**

<u>Experimental Data</u>:

- **#59B: Scale jet measurements to support LTO noise reduction of supersonic aircraft technology development**
- **- GIT (Krish Ahuja) – 15min**