



INNOVATIVE TECHNOLOGY
APPLICATIONS COMPANY

PENNSSTATE



Noise Prediction Software

The noise from the turbulent, hot, supersonic jets at take-offs and landings has significant safety implications for launch personnel. CHOPA is a highly-efficient and reliable CFD flow solver that captures the most important effects at low computational cost.

Advanced computational fluid dynamics (CFD) modeling and simulation software such as CHOPA allows analysis for the design and performance of nozzle components that attenuate the exhaust jet noise of the powerplants of modern tactical aircraft.

High Order Parallel Computing (4th Order)

- More accuracy with less computer resources
- Faster solution turn around on modest systems

Immersed Boundary Method (IBM)

- Easy to explore noise reduction designs that include physics
- Easy to include noise devices

Non-Linear Disturbance Equations (NLDE)

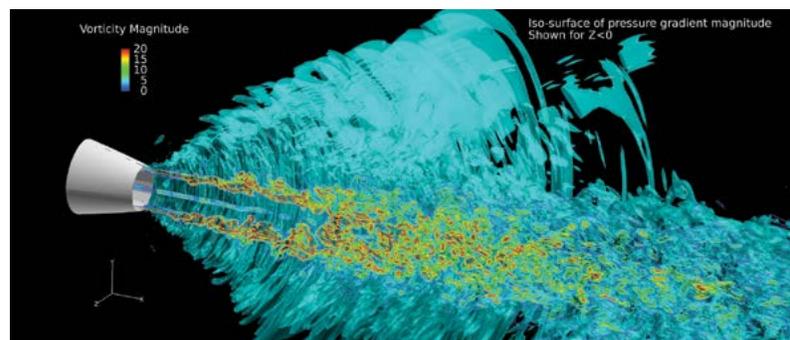
- Allows full physical problem to be included at reduced cost
- Effects of full aircraft and carrier deck can be captured

Non-Matching Boundaries

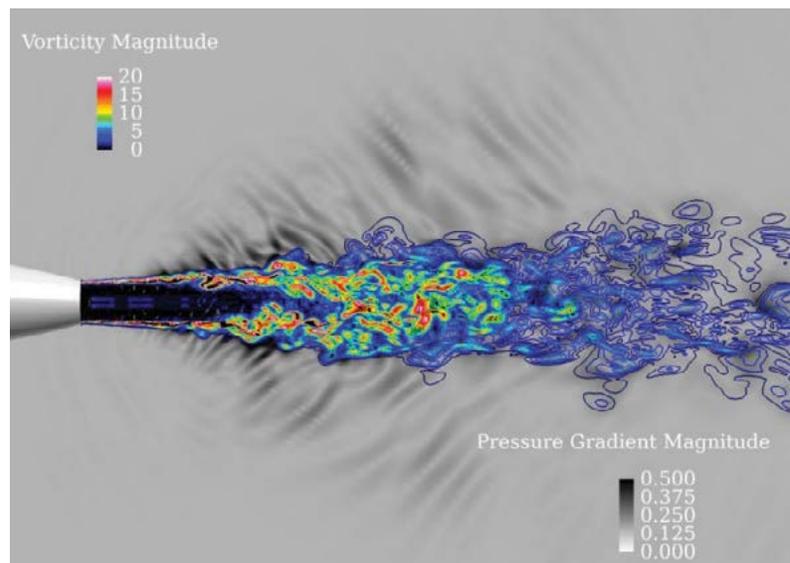
- Local high-order interpolation
- Enables locally enhanced grid refinement

Implicit Solver

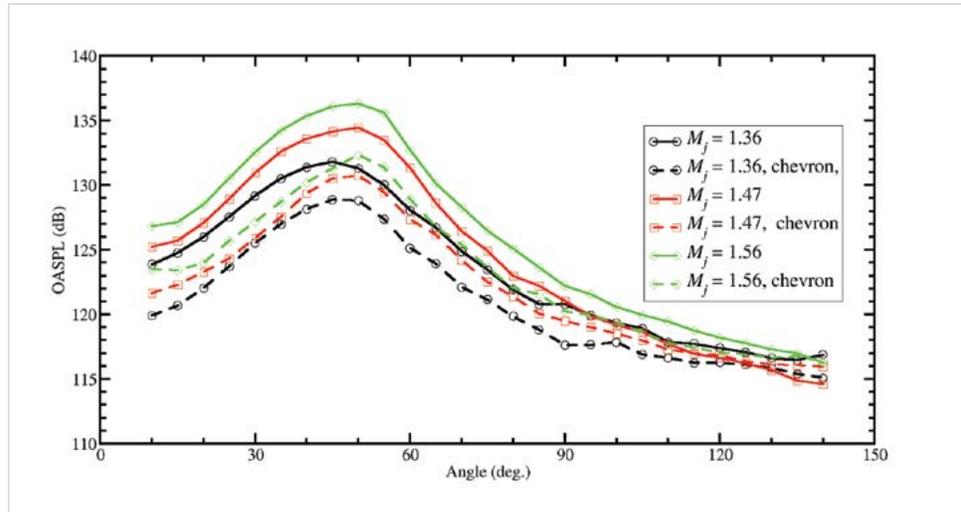
- Second order in time
- Newton sub-iterations to maintain accuracy



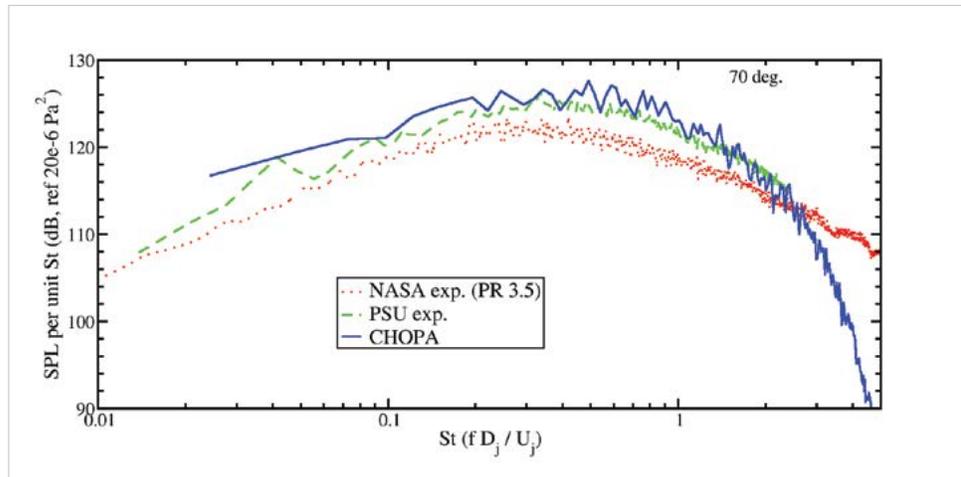
Compressible High Order Parallel Acoustics (CHOPA) for accurate prediction of the acoustics of hot supersonic jets.



Gray scale shading shows acoustical propagation and color contours show vortical structures in the hot supersonic jet.



CHOPA demonstrates the ability to predict the impact of chevrons (noise-reduction devices).



CHOPA captures accurate physics at moderate costs.

ITAC, LLC is a high-technology, small business company providing contract research and development, and consulting services for the aerospace, defense, and energy sectors. Combining fundamental research capabilities and leading-edge expertise, ITAC collaborates with academic and industry experts to provide its customers high-performance solutions and products in areas of aerodynamics, aero-optics, aero-acoustics, and computational flow physics.

Contact us for tech-transition & research opportunities!

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