Jet Noise Reduction (JNR)

ONR Program Code 35 July 2012

At a Glance

What is it?

- Through long-term research, the JNR Project aims to understand the physics of jet noise produced by high-performance military aircraft, identify materiel/non-materiel solutions to reduce noise, and develop and transition the technologies in support of the Warfighter and the Community.

How does it work?

Guided by a Government-wide panel of S&T experts, the JNR project

- Supports the development of theoretical noise models, prediction tools, noise control strategies, diagnostic tools, and enhanced source localization and propagation techniques.
- Proposes MIL/ANSI noise measurement standards for military aircraft.

What will it accomplish?

- Improves the physical understanding of noise sources in supersonic jet exhausts from high-performance military aircraft.
- Provides critical insight for the development of effective noise control strategies and associated noise reduction potential.
- Provides fundamental tools to guide the design of future, optimized, noise-control systems.
- Guides noise measurement requirements for naval aviation systems.

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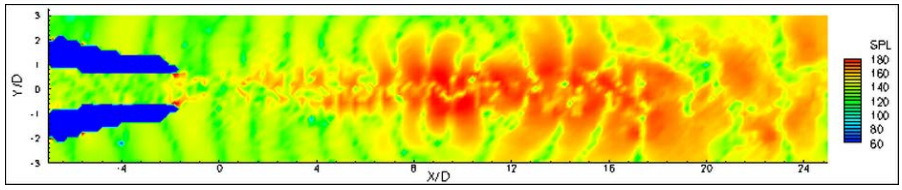

The JNR Project is part of ONR's Noise- Induced Hearing Loss (NIHL) Program. As a result of the health and environmental impacts of noise on multiple services within DoD and the interest in noise for many agencies within the Government, the Navy convened a panel of Government-wide noise experts in 2010 to guide the JNR Project. The JNR S&T Panel consists of members from the Navy, Air Force, NASA and the FAA and includes jet noise researchers, aircraft program representatives, and technology experts. In fiscal year 2010, initial funding was allocated to support the basic program structure and for the two main tasks given high priority; developing a physics-based understanding of jet noise and developing a standard facilitating high-quality, supersonic, jet-noise measurements.
In fiscal year 2011, a Basic Research effort focusing on the development of tools for the active control of hot, supersonic jets was initiated. The Basic Research effort supports the development of theoretical noise models, prediction tools, noise control strategies, diagnostic tools, and enhanced source localization and propagation techniques. Additionally, work continues on developing noise-measurement standards for military aircraft.

The Project continues to support the development of fundamental tools that will enable the optimized design of noise-control systems for legacy, emerging, and future tactical aircraft. Members of the JNR S&T Panel continue to work across the community to identify technology transition opportunities and provide guidance on improved approaches for low-noise designs. The Project continues to examine noise mitigation approaches at all levels of technology maturity, both computationally and experimentally, and encourages research into new areas of noise control through theoretical development and experimental validation.

Research Challenges and Opportunities:

- Effective noise-source models for noise produced by large-scale, jet structures in hot, supersonic jets
- Efficient and reliable time-resolved noise prediction tools
- Validation data for theoretical and computational models
- Effective active-control strategies for exhaust noise