

Aviation 2021 Call for Papers Supplemental Information

Session Description

Acoustic/Fluid Dynamics Interactions

Analysis, measurements and control of subsonic and supersonic flows, vortex-driven flows, reacting and non-reacting flows, combustion instabilities, flow-acoustic interactions and resonance, and flow receptivity to acoustic disturbances.

Active Control of Noise, Vibration and Flows

Active control of noise and vibration; noise cancellation through active acoustic treatments and active source control as related to noise and vibration in the cabin and within engine ducts and jets; development of associated sensors and actuators, and feedback and feed-forward control strategies.

Advanced Testing Techniques

Development and application of novel testing techniques, advanced diagnostic methods and test facilities. Topics of particular interest are detailed measurements of mean and turbulent flow phenomena that contribute to noise generation and/or affect the radiated sound; source localization including phased arrays; properties of sound-absorbing materials; interior-noise test facilities, including source simulation and noise-path identification; and comparison of model and full-scale testing.

Airframe/High-Lift Noise

Noise source mechanisms of flow/surface interaction as related to airframe acoustics. Measurement, analysis and prediction methods for wing (including trailing edge), flap, slat and landing gear noise. Noise reduction strategies including devices and methods of circulation and boundary layer control.

Community Noise, Sonic Boom and Metrics

Response of individuals and the community to aircraft noise, including noise from rotating wings, prop-fans, subsonic and supersonic jets and sonic boom. Virtual acoustic simulations. Noise assessment methodologies and criteria for acceptability. Tools for land-use planning with respect to aircraft noise. Development of airport noise reduction strategies and airport noise monitoring methods. Noise abatement procedures.

Computational Aeroacoustics

Development of innovative numerical techniques for aeroacoustic applications. Emphasis is placed on the ability of algorithms to accurately simulate and/or track acoustic information from flows, and on the development of proper boundary conditions for aeroacoustic applications. Applications are sought in areas of sound generation by turbulence, unsteady flows or moving boundaries; and propagation, transmission, and scattering of sound through non-uniform flows.

Duct Acoustics

New and innovative methods to analyze, predict, and control turbomachinery noise propagating through nacelle ducts. A topic of particular interest is lightweight passive and active/adaptive liners to control the noise in ducts.

Emerging Urban and Advanced Air Mobility Noise

Noise associated with small/medium UAS physical logistics operations (e.g. package delivery), urban air mobility (e.g. air taxi) and thin/short haul sectors. The primary focus is on the sources of noise from the rotor, propeller, ducted fans or electric motors as well as installation effects, acoustic propagation through complex terrain, human response, community noise and vehicle operations.

General Acoustics

Theoretical, numerical, and experimental research involving all areas of physical acoustics and those involving noise associated to commercial systems.

Integration Effects and Flight Acoustics

Aeroacoustic effects of propulsion and airframe integration. Understanding and prediction of noise source modifications originating from the interaction of flow and/or acoustic propagation mechanisms. Noise reduction approaches based on aspects of propulsion and airframe system integration or aircraft configuration. Integrated test model and flight vehicle acoustic experimental and/or prediction research.

Interior Noise/Structural Acoustics and Metamaterials

Reduction of interior noise and vibration associated with aircraft, launch vehicles, automobiles and trains. Noise transmission through structures, vibro-acoustic testing and prediction methods. Acoustic meta materials.

Jet Aeroacoustics

Aerodynamics and aeroacoustics of jets focusing on identifying and modeling noise production mechanisms; near-field noise; shock noise; turbulence prediction and characterization for subsonic, supersonic, and circular, non-circular, and multi-stream jets including those associated with launch vehicles; and suppression methods for both subsonic and supersonic jet noise. Of particular interest are new aeroacoustic modeling methods and flow and noise diagnostics techniques; and the effects of jet heating.

Loads/Sonic Fatigue

Prediction, testing, design, and control of sonic fatigue; sources of fluctuating loads on structures; jet/structure interactions; flow-resonance phenomena; structural and material stress-strain responses; and high temperature effects.

Propeller, Rotorcraft and V/STOL Noise

Conventional and advanced single and counter rotating propellers; tonal and broadband noise, propagation and ground reflection effects, fuselage boundary layer refraction and scattering, noise source control, effects of inflow distortions, and installation effects. Rotorcraft source studies,

including rotor harmonic noise, high speed impulsive and blade/vortex interaction noise, blade/turbulence interaction noise, jet/surface interaction noise including both ground and aircraft surfaces. Components and system noise prediction and validation, ground and flight test measurements, and noise control/reduction strategies.

Turbomachinery and Core Noise

Generation, propagation and control of noise from fans, compressors and turbines; combustion noise; propagation and interaction with the mean flow field; transmission and reflection from blade and vane rows; control using active or passive techniques; and measurement techniques for source identification.

Special Sessions Sponsored by the Aeroacoustics Technical Committee

Hybrid Anechoic Wind Tunnel Workshop

Session Scope: The Hybrid Anechoic Tunnel Workshop is a forum that brings together researchers interested in hybrid anechoic aeroacoustic wind tunnels and their application. A major goal is to develop common test cases to cross validate and characterize hybrid anechoic wind tunnels as well as provide data on canonical test cases to the broader aeroacoustics community. The purpose of the special session is (a) for participants to present papers describing measurements on current common test cases (including NACA 63018, NACA 0012 and 30P30N airfoil configurations) or a configuration they would like to propose as a common test case, and (b) for participants to present papers describing quantitative and comparative characterizations, or methods for characterization, of Hybrid Anechoic Wind Tunnels using laser impulse calibration.

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