FM11L_12156

XXI International Congress of Theoretical and Applied Mechanics
Warsaw, Poland, August 15–21, 2004

On the Possibility and Prospects of Turbulent Flow Noise Control

Victor F. Kopiev

TsAGI, Moscow Branch, Acoustic Division, Russia

The main problem of realizing the idea of active noise control rests on the absence of conceptual study of the reduction strategy itself and this, in its turn, reflects our insufficient understanding of the principal mechanisms of noise generation by turbulence. The mechanism of noise generation for supersonic jets is essentially clear and is connected mainly with instability waves developing downstream from the nozzle. Two strategies for noise control in supersonic jet are considered: non-adaptive and adaptive. The first is based on instability wave coupling and transformation of modes in the initial part of slowly corrugated supersonic jet due to small deformation of nozzle. The second one based on new experimental technique on multi-channel signal decomposition, giving the example of active action on the radiating part of turbulence but not control of the all manifold of turbulence disturbances. This situation is quite different from that for subsonic flows, where a complete understanding of noise radiation mechanisms is yet absent.

View the extended summary