Large eddy simulation based on relaxation filtering – methodology and application to selected aeroacoustic problems.

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Abstract – We will start the talk with a presentation of the large eddy simulation approach based on relaxation filtering (LES-RF). This method represents a return-to-first-principles in turbulence simulation, in that the artificial-viscosity paradigm, used by most turbulence models of the past half-century, is replaced by an explicit relaxation filtering. Aeroacoustics is today a central element in many engineering areas as aeronautics, ground transportations or energy production. We will summarized recent work regarding the direct computation of aerodynamic noise, and the use of these simulations to improve our understanding of noise generation by turbulent flows.

Christophe Bailly is a Professor of Fluid Mechanics and Acoustics at the Ecole Centrale de Lyon (ECL) in France and junior member of the Institut Universitaire de France (IUF). He received his Ph.D. in Aeroacoustics from the Ecole Centrale Paris in 1994. He joined the Centre Acoustique of the Laboratoire de Mécanique des Fluides et d’Acoustique, Centre National de la Recherche Scientifique (LMFA UMR CNRS 5509), at ECL in 1995. His research activities lie in the area of turbulence and noise generation with current emphasis on computational aeroacoustics, compressible large eddy simulation, jet noise and sound wave propagation. His is co-author, with Geneviève Comte-Bellot, of one textbook in turbulence, has authored or co-authored more than 65 papers in refereed journals and co-supervised over 18 Ph.D. He is also the recipient of the Yves Rocard Prize from the French Acoustical Society (1996) and of the Alexandre Joannidès Prize from the French Academy of Sciences (2001). He is currently an Associate Editor of the AIAA Journal.

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