



ERCOFTAC SIG 39

**Computational
Aeroacoustics, III**

4-5 June 2018

ONEA, Paris, France



Course coordinator: Prof. Christophe Bailly, EC Lyons, France

Monday 4 June 2018

08:30 – Registration & Coffee

09:00 – An overview of the numerical simulation of turbulent flows (C. Bailly)

10:00 – Refreshments

10:30 – Simple sources and Lighthill's analogy (G. Gabard)

11:30 – Vortex sound theory (C. Schram)

12:30 – Lunch

13:30 – Hybrid APE/LES Analysis: Part I Theory (W. Schröder)

14:30 – Hybrid APE/LES Analysis:

– Part II Airframe, Jet, and Combustion Noise (W. Schröder)

15:30 – Refreshments

16:00 – Solid surfaces in acoustical analogies (C. Schram)

17:00 – Q&A

17:30 – Close

Tuesday 5 June 2018

08:30 – Coffee

09:00 – Review of some classical configurations: cavity, cylinder & airfoil (C. Bailly)

10:00 – Aeroacoustics approaches in the framework of unstructured grids (G. Gabard)

11:00 – Refreshments

11:30 – Duct acoustics (G. Gabard)

12:30 – Lunch

13:30 – Computational aeroacoustics and Direct Noise Computation (C. Bogey)

14:30 – Guidelines for accurate simulations and practical applications to jets (C. Bogey)

15:30 – Refreshments

16:00 – Q&A

16:30 – Close



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Aim

This course is intended for researchers in industry and in academia including Ph.D. Students with a good knowledge in fluid mechanics, who would like to build up or widen their knowledge in the field of aeroacoustics (modeling, computational tools and industrial applications). It will first provide a comprehensive overview of recent insights of aeroacoustics theories (Lighthill's analogy and vortex sound theory, extensive hybrid approaches and wave extrapolation methods, duct acoustics). A number of practical problems involving the coupling between CFD's results and CAA will be also thoroughly discussed (e.g. how design a mesh size for aeroacoustics applications using large eddy simulation, inclusion of mean flow effects via hybrid formulations such as the acoustic perturbation equations, presence of surfaces, aeroacoustic couplings, ...) and realistic applications performed by the instructors (aeronautics, car industry, propulsion, energy,...) will be discussed. Advanced computational aeroacoustics methods will be also presented as well as what we can learn from the direct computation of aerodynamic noise. Finally, specific topics reflecting participant interests will be discussed in a final round table session.

Lecturers ³⁵/₁₇

- Prof. Christophe Bailly, Ecole Centrale de Lyon, France (Coordinator).**
- Dr. Christophe Bogey, Ecole Centrale de Lyon, France**
- Dr. Gwenael Gabard, University of Southampton, England**
- Prof Christopher Schram, Institute von Karman, Belgium**
- Prof. Wolfgang Schröder, Institute of Aerodynamics, Aachen, Germany**

Registration of interest: richard.seoud-ieo@ercoftac.org

Fees:

Members €575

Non-Members €850

PhD student €450

Course fees cover course material, refreshment, lunch, however, accommodation not included.