Advanced Topics in Acoustics Simulation

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Abstract

In this session, we will discuss and showcase a few examples of advanced acoustics applications. In this context, "advanced" means problems that cannot simply be modeled "out-of-the-box," but require the flexibility and strengths of COMSOL Multiphysics® software.

Topics include:
• Coupling of several space dimensions
• Optimization
• Equation-based modeling
• Advanced boundary conditions
• Postprocessing

One example covered during the session is setting up port conditions in systems modeled with Thermoacoustics in order to correctly couple waveguides to lumped systems or acoustic two-ports. These topics will be further discussed and presented by the guest speakers. Riccardo Balistreri of QSC Audio Products will show his work on optimization of speakers, whereas Hisham Assi of the University of Toronto will discuss and show an advanced equation-based formulation of absorbing boundaries in the time domain.

Finally, some of the future plans for the Acoustics Module roadmap will be presented, including ideas for new physics interfaces, new numerical methods, and general usability improvements.

Figures used in the abstract

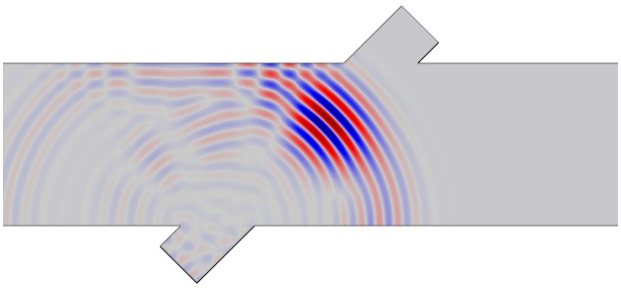

Figure 1: Modeling acoustics with flow using time explicit methods.

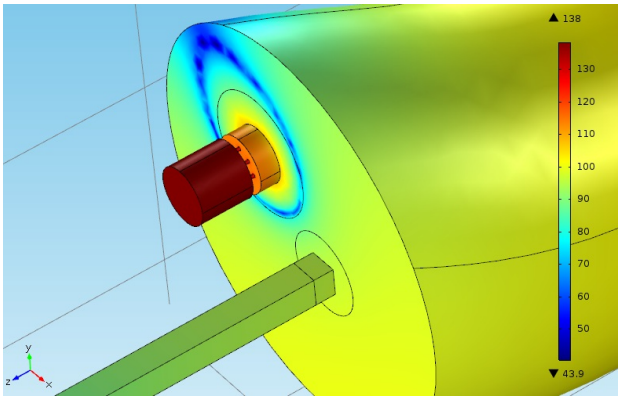

Figure 2: Using ports in Thermoacoustics simulations.