

## « Combustion Noise investigation in helicopter engines »

As combustion noise proved to be of crucial importance during a flight test, with respect to other helicopter noise sources, a comprehensive roadmap was built to address this complex mechanism.

A full-scale engine measurement campaign has first been conducted, which implies innovative sensors in dedicated engine casings and new test analysis methodologies. Then, taking advantage of already existing bits and pieces, a calculation methodology has been put together at CERFACS, carefully validated upon internal and external measurements from the former test.

This methodology includes a high-fidelity LES calculation of the combustion chamber, a 1D code to model noise generation and propagation through turbine blade rows, and an Helmholtz solver to compute noise radiation in the near field. Several approaches are discussed and compared to experimental data.