

Aero-Engine Acoustic Tests

Provide technical memory capitalizing on all test campaigns analysis results. Streamline and automate the static acoustic tests analysis process

THE CONTEXT

The ongoing increase of air traffic, the enlarging of airports, the noise emitted by planes during landing and takeoff have become fundamental problems for our environment. In response to the problem, the regulating authorities have reinforced standards.

To cope with certification requirements (ICAO standards), engine manufacturers and airplane designers must work together to improve engine performance and reduce noise emission.

Acoustic performance and noise reduction are key factors in engine design



REQUIREMENTS

In face of such constraints, each company must work out and validate methods to estimate the behavior of the engine and its components, and to identify noise sources.

These companies require solutions to help them design and combine analysis methods in order to predict the behavior of engines according to a large variety of data input and parameters. This kind of application should be able to:

- Gather all the test and simulation data together
- Provide advanced processing functions
- Compare tests made in different conditions
- Share results with partners and contractors

BENEFITS

- Dedicated data aero-engine data structure built in
- Gather and share engine acoustic data from multiple test campaigns
- Advanced display functions
- Speed up analysis & correlation with simulation

DynaWorks

Application Note

Aero-Engine Acoustic

Customers Profile

- Tests
- Engineering

Industry/Market

- Aeronautics
- Acoustic Research

Objectives

- Perform advanced dedicated data processing dedicated to static acoustic data
- Provide a powerful analysis and data comparison platform
- Share test and analysis results
- Insure processing traceability



The “Aero-Engine Acoustic Tests” application developed by Intespace is based on our DynaWorks Professional Edition. Fully integrated into the engine manufacturing process for static acoustic tests performed on aero-engines, it is a unique solution to:

Manage all data related to tests campaigns in a centralized database

To be able to perform such analysis our DynaWorks application gathers and computes large amount of data such as the test configuration (engine configuration, test set up...), the noise source files, the engine parameters (piloting parameters, measured thermo parameters), the instrumentation location and weather conditions.

Validate measurements according to weather and piloting conditions

The collected data are then validated. The application checks the engine piloting parameters compared to the targets (tolerance and deviation), and the weather conditions compared to acceptable norms.

Transpose noise fields and normalize to identical distance and weather conditions

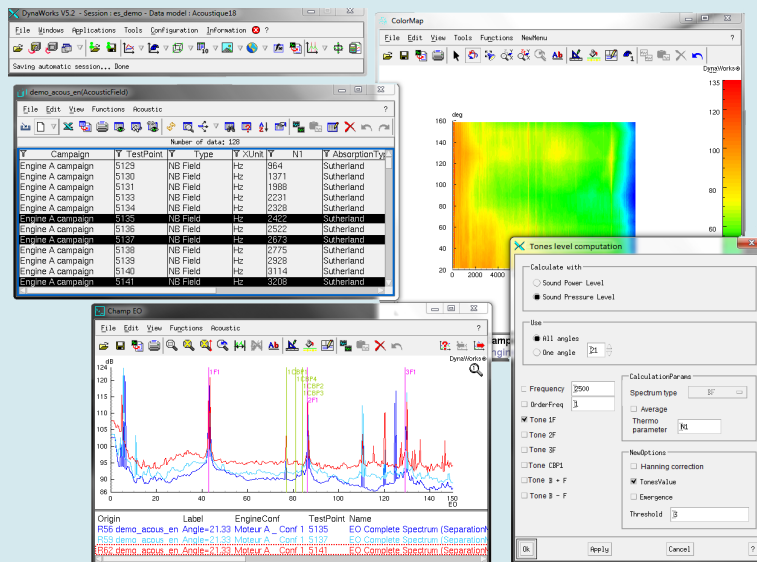
Compute and display the whole set of acoustic data using the wide range of expert analysis and post-processing functions:

- Tones identification and visualization
- Global, Tones and Broadband contributions computation
- DB spectra : Narrow bands and Third Octave Bands
- Acoustic power (PWL)
- OASPL, Acoustic fields (PNL, PNLT...)
- 2D or 3D advanced displays of phenomenon versus Frequency or Engine Orders
- Apply specific corrections to refine analysis: smoothing, extrapolations

Compare data from different test campaigns, generate reports and share results with coworkers, partners and contractors.

The standard features of the DynaWorks solution allow automatic comparison of several normalized acoustic tests, creation of reports based on corporate templates and direct online results sharing with authorized people involved in the project.

The open architecture used to develop this application provides a flexible import interface for data collection and an easy way to expand the capabilities to new features.



Based on DynaWorks, the Aero-Engine Acoustic Tests application benefits from the most appropriate test data management systems on the market with its advanced processing and visualizations tools to provide engine manufacturers a real competitive advantage.

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