Introduction

This dataset accompanies the paper "Aeroacoustic Benchmarking of Trailing-edge Noise from a NACA 633-018 Airfoil with Trailing-edge Serrations" published in the AIAA Journal. (https://doi.org/10.2514/1.J061630). This document provides further explanations to each file and folder in this dataset.

LRM_Master and HRM_Master files

These .txt files specify the test cases. The first column assigns a unique reference code (in LRM-xxx and HRM-xxx formats) to each case. The codes are used throughout the database for each case where applicable. In the subsequent columns, the model configurations, e.g. TE configurations, clean/forced, are specified. Next, the flow and atmospheric conditions are specified. These conditions can be assumed during acoustic measurements, thus can be used for scaling. Finally, the extracted boundary-layer parameters are provided where applicable.

UpdatesLog

The UpdatesLog.txt file records updates made to this database.

00Coordinates folder

This folder contains .txt files in which coordinates of the static pressure taps on the models and the microphones on the array are provided as in Appendix C of the paper. The file names are self explanatory.

01Aerodynamics folder

This folder contains aerodynamic coefficients and boundary layer profiles.

01Aerodynamics\01c_p, ...\02c_l, ...\03c_d folders

These folders contains interactive MATLAB .fig files that plot the aerodynamic coefficients as appeared in the paper. The file names are the same as the figure names in the paper. Users can interact with and extract data directly from these files.

01Aerodynamics\04BoundaryLayerProfiles folder

This folder contains two subfolders, ...\01LRM and ...\02HRM, providing boundary-layer velocity profiles measured at the TE of the models (detailed specifications are provided in the paper).

For the LRM, the velocity profiles are provided in .txt files named after the case reference codes. Each file contains 3 columns, column 1 is the HWA probe location in mm relative to the start of the measurement traverse, column 2 is the mean velocity in m/s, column 3 is the RMS velocity in m/s.

For the HRM, the velocity profiles are provided in interactive MATLAB .fig files that plot the velocity profiles as appeared on the paper. The file names are the same as the figure names in the paper. Users can interact with and extract data directly from these files.

==========
02Acoustics folder
==========
This folder contains post-processed acoustic data measured by the microphone arrays.

02Acoustics\LRM\BeamformingSPL folder and
02Acoustics\HRM\BeamformingSPL folder

This folder contains narrowband SPL spectra obtained by the beamforming method specified in the paper. The SPL spectra in dB are provided in .txt files named after the case reference codes. The corresponding frequencies in Hz are provided in Frequencies.txt.