JAXA' wind tunnel test data of 30P30N for Category 7 at AIAA BANC Workshop and APC Workshop

POC:
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This folder contains the measurement data reduced from JAXA's measurements in the LWT2-Hard-Wall Wind Tunnel Test during 2013[1] and LWT2-Kevlar Wind Tunnel Test during 2017[2]. Refer the listed papers when you use the data.

References

1. Murayama, M., Nakakita, K., Yamamoto, K., Ura, H., Ito, Y., and Choudhari, M. M., "Experimental Study of Slat Noise from 30P30N Three-Element High-Lift Airfoil in JAXA Hard-Wall Low-Speed Wind Tunnel," AIAA Paper 2014-2080, 2014.
2. Murayama, M., Yokokawa, Y., Ura, H., Nakakita, K., Yamamoto, K., Ito, Y., Takaishi, T., Sakai, R., Shimoda, K., Kato, T., and Homma, T., "Experimental Study of Slat Noise from 30P30N Three-Element High-Lift Airfoil in JAXA Kevlar-Wall Low-Speed Wind Tunnel," AIAA Paper 2018-3460, 2018.

The measurement data reduced from JAXA's measurements in the LWT2-Hard-Wall Wind Tunnel Test during 2013[1].

- Data_BANC-Category7_30P30N_Murayama_JAXA_LWT2_AoAu6__NormalizedTo1in.tar.gz
- Data_BANC-Category7_30P30N_Murayama_JAXA_LWT2_AoAu10__NormalizedTo1in.tar.gz

Data presented herein corresponds to open-air-CFD (SA turbulence model) equivalent AoA = 5.5 and 9.5 deg., respectively, as described in Ref. 1. The corresponding values of the actual, i.e., uncorrected, geometric AoA correspond to AoAu = 6 and 10 deg., respectively.

The following sequence of steps was applied during the data reduction of the acoustic measurements:

1. First, the data obtained by the integration of SD3+FD3 regions using microphone array were normalized to 1m location from the model rotation center (see Ref. 1 for further details).

2. The data was normalized to 1 inch spanwise width of the source region.

3. Finally, the data was adjusted to account for the attenuation of acoustic signal from 1m to 10c.

The measurement data reduced from JAXA's measurements in the LWT2-Kevlar Wind Tunnel Test during 2017[2].

- Data_BANC-Category7_and_APC4_30P30N_Murayama_JAXA_LWT2-Kevlar2017_AoAu7__NormalizedTo1in.tar.gz
- Data_BANC-Category7_and_APC4_30P30N_Murayama_JAXA_LWT2-Kevlar2017_AoAu11__NormalizedTo1in.tar.gz
- Data_BANC-Category7_and_APC4_30P30N_Murayama_JAXA_LWT2-Kevlar2017_AoAu16__NormalizedTo1in.tar.gz

Data presented herein corresponds to open-air-CFD (SA turbulence model) equivalent AoA = 5.5, 9.5, and 14 deg., respectively, as described in Ref. 2. The corresponding values of the actual, i.e., uncorrected, geometric AoA correspond to AoAu = 7, 11, and 16 deg., respectively.

Notes:

(a) The acoustic measurements are reported for three different observer locations. Specifically, for comparison with CFD, these microphone locations are denoted as 10c249deg, 10c270deg, 10c291deg, respectively.

The following sequence of steps was applied during the data reduction of the acoustic measurements:

1. First, the data obtained by the integration of SD3+FD3 regions using microphone array were normalized to 1m location from the model rotation center (see Ref. 2 for further details).

Microphone array locations:

- 249deg (Upstream of 270 deg location)
  - X=-431.5mm, Y=+1124.1mm ->R=1204.07mm(=2.63358c_stowed)
- 270deg (Center)
  - X=±0mm, Y=+1204.1mm ->R=1204.10mm(=2.63364c_stowed)
- 291deg (Downstream)
  - X=-431.5mm, Y=+1124.1mm ->R=1204.07mm(=2.63358c_stowed)

2. The data was normalized to 1 inch spanwise width of the source region.

3. Finally, the data was adjusted to account for the attenuation of acoustic signal from 1m to 10c.

(b) The definition of center of directivity for CFD (rotation center when AoA changes) is trailing-edge of slat or the origin of geometry/mesh data. The directivity in CFD was defined so that a reference angle of 0 deg. corresponds to the flow direction.

(c) The definition of center of directivity (rotation center when AoA changes) for wind tunnel data is 0.4c. The microphone was fixed and the model was rotated. The center location is slightly different from CFD, so the angles of directivity are slightly different from the CFD definition.
Also, the difference between uncorrected and corrected angles of attack is approximately 1.5 to 2.0deg. Therefore, a difference of 1.5 deg. to 2 deg. with respect to the desired directivity angle may occur.

(d) The datafiles currently provided in this folder do not include coherence data based on the measurements of surface pressure fluctuations.