**Data Release for LDV Probe 1**

**July 10, 2020**

Each of the LDV data files contains 48 columns of data, with the first row providing the parameter label for each column and the second row providing a zone label for Tecplot. There is one type of data file contained in the data package: the \*\_prof.dat files contain profiles that were acquired by surveying the flow field in the Y direction at a fixed X and Z location. In this case, the zone label specifies the X and Z location of the survey.

The column labels in the data files are defined as follows:

X, Y, Z: denote the (x, y, z)-coordinate of each measurement point in the profile in millimeters (mm). These coordinates are in a body-fixed coordinate system with the origin at the nose tip. Positive X is in the downstream direction, positive Y is toward the starboard side of the model, and positive Z is up.

Rec: Reynolds number based on the chord at the wing planform break divided by 106.

alpha: model pitch angle in degrees.

u, v, w: denote the x, y, and z-components of the mean velocity. These values are non-dimensionalized by the freestream tunnel velocity.

uu, vv, ww, uv, uw, vw: denote the six independent components of the Reynolds-stress tensor. These values are non-dimensionalized by the freestream tunnel velocity squared.

uuu, vvv, www, uvw, uuv, uuw, uvv, uww, vvw, wwv: denote the ten independent components of the velocity triple products. These values are non-dimensionalized by the freestream tunnel velocity cubed.

U\_X, U\_Y, U\_Z: denote the (x, y, z)-coordinate uncertainty for each measurement point in the profile in millimeters (mm).

U\_Rec: denotes the uncertainty in the Reynolds number based on the chord at the wing planform break divided by 106.

U\_alpha: denotes the uncertainty in the model pitch angle in degrees.

U\_u, U\_v, U\_w: denote the uncertainty in the x, y, and z-components of the mean velocity. These values are non-dimensionalized by the freestream tunnel velocity.

U\_uu, U\_vv, U\_ww, U\_uv, U\_uw, U\_vw: denote the uncertainty in the Reynolds stress components. These values are non-dimensionalized by the freestream tunnel velocity squared.

U\_uuu, U\_vvv, U\_www, U\_uvw, U\_uuv, U\_uuw, U\_uvv, U\_uww, U\_vvw, U\_wwv: denote the uncertainty in the velocity triple products. These values are non-dimensionalized by the freestream tunnel velocity cubed.

The following table provides a list of the profiles acquired on the F6 wing with leading-edge horn at a pitch angle of -2.5 degrees. The data files are located in folder **F6\_Horn\_AOA\_m2p5** and the filenames follow the pattern: alpha-2.5\_x\*\_z\*\_F6h\_prof.dat. The parameter yo in the table denotes the y location of the fuselage surface. All of the profiles indicated in the table were acquired with the model upright (roll angle of 0 degrees).

|  |  |  |  |
| --- | --- | --- | --- |
| x (mm) | z (mm) | yo (mm) | File Type |
| 1168.40 | -60.00 | -236.1 | Profile |
| 1168.40 | -30.00 | -236.1 | Profile |
| 1168.40 | 0.00 | -236.1 | Profile |
| 1168.40 | 30.00 | -236.1 | Profile |
| 1168.40 | 60.00 | -236.1 | Profile |
|  |  |  |  |
| 1864.20 | 98.05 | -236.1 | Profile |
| 1869.20 | 98.05 | -236.1 | Profile |
| 1874.20 | 98.05 | -236.1 | Profile |
| 1879.20 | 98.05 | -236.1 | Profile |
| 1884.20 | 98.05 | -236.1 | Profile |
| 1889.20 | 98.05 | -236.1 | Profile |
| 1894.20 | 98.05 | -236.1 | Profile |
| 1899.20 | 98.05 | -236.1 | Profile |
| 1904.20 | 98.05 | -236.1 | Profile |
| 1909.20 | 98.05 | -236.1 | Profile |
| 1914.20 | 98.05 | -236.1 | Profile |
|  |  |  |  |
| 1859.20 | 55.05 | -236.1 | Profile |
| 1904.20 | 71.20 | -236.1 | Profile |
|  |  |  |  |
| 1864.20 | 6.20 | -236.1 | Profile |
| 1879.20 | 6.20 | -236.1 | Profile |
| 1904.20 | 6.20 | -236.1 | Profile |
| 1919.20 | 6.20 | -236.1 | Profile |

The following table provides a list of REPEAT profiles acquired on the F6 wing with leading-edge horn at a pitch angle of -2.5 degrees. The data files are located in folder **F6\_Horn\_AOA\_m2p5\_Repeats** and the filenames follow the pattern: alpha-2.5\_x\*\_z\*\_F6h\_prof\_rep\*.dat. The parameter yo in the table denotes the y location of the fuselage surface. The rep\* part of the filename denotes the repeat index, and the table denotes whether a repeat was taken with the model upright (roll angle of 0 deg) or with the model inverted (roll angle of 180 deg).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x (mm) | z (mm) | yo (mm) | rep & (roll angle, deg) | File Type |
| 1168.40 | -60.00 | -236.1 | 1 (0)  2 (180) | Profile |
| 1168.40 | 0.00 | -236.1 | 1 (0)  2 (0)  3 (180) | Profile |
| 1168.40 | 30.00 | -236.1 | 1 (0)  2 (0) | Profile |
| 1168.40 | 60.00 | -236.1 | 1 (0)  2 (180) | Profile |
| 1859.20 | 55.05 | -236.1 | 1 (0) | Profile |
| 1869.20 | 98.05 | -236.1 | 1 (0) | Profile |
| 1904.20 | 6.20 | -236.1 | 1 (0) | Profile |
| 1919.20 | 6.20 | -236.1 | 1 (0) | Profile |

The following table provides a list of the profiles acquired on the F6 wing with leading-edge horn at a pitch angle of 5.0 degrees. The data files are located in folder **F6\_Horn\_AOA\_5** and the filenames follow the pattern: alpha5.0\_x\*\_z\*\_F6h\_prof.dat. The parameter yo in the table denotes the y location of the fuselage surface. All of the profiles indicated in the table were acquired with the model upright (roll angle of 0 degrees).

|  |  |  |  |
| --- | --- | --- | --- |
| x (mm) | z (mm) | yo (mm) | File Type |
| 1168.40 | -60.00 | -236.1 | Profile |
| 1168.40 | -30.00 | -236.1 | Profile |
| 1168.40 | 0.00 | -236.1 | Profile |
| 1168.40 | 30.00 | -236.1 | Profile |
| 1168.40 | 60.00 | -236.1 | Profile |
|  |  |  |  |
| 1864.20 | 98.05 | -236.1 | Profile |
| 1869.20 | 98.05 | -236.1 | Profile |
| 1874.20 | 98.05 | -236.1 | Profile |
| 1879.20 | 98.05 | -236.1 | Profile |
| 1884.20 | 98.05 | -236.1 | Profile |
| 1889.20 | 98.05 | -236.1 | Profile |
| 1894.20 | 98.05 | -236.1 | Profile |
| 1899.20 | 98.05 | -236.1 | Profile |
| 1904.20 | 98.05 | -236.1 | Profile |
| 1909.20 | 98.05 | -236.1 | Profile |
| 1914.20 | 98.05 | -236.1 | Profile |
| 1921.19 | 98.05 | -236.1 | Profile |
|  |  |  |  |
| 1859.20 | 55.05 | -236.1 | Profile |
| 1904.20 | 71.20 | -236.1 | Profile |
|  |  |  |  |
| 1864.20 | 6.20 | -236.1 | Profile |
| 1879.20 | 6.20 | -236.1 | Profile |
| 1904.20 | 6.20 | -236.1 | Profile |
| 1919.20 | 6.20 | -236.1 | Profile |

The following table provides a list of REPEAT profiles acquired on the F6 wing with leading-edge horn at a pitch angle of 5.0 degrees. The data files are located in folder **F6\_Horn\_AOA\_5\_Repeats** and the filenames follow the pattern: alpha5.0\_x\*\_z\*\_F6h\_prof\_rep\*.dat. The parameter yo in the table denotes the y location of the fuselage surface. The rep\* part of the filename denotes the repeat index, and the table denotes whether a repeat was taken with the model upright (roll angle of 0 deg) or with the model inverted (roll angle of 180 deg).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x (mm) | z (mm) | yo (mm) | rep & (roll angle, deg) | File Type |
| 1168.40 | -60.00 | -236.1 | 1 (0)  2 (0)  3 (0)  4 (180)  5 (180) | Profile |
| 1168.40 | 0.00 | -236.1 | 1 (0)  2 (0)  3 (0)  4 (180)  5 (180)  6 (0) | Profile |
| 1168.40 | 30.00 | -236.1 | 1 (0) | Profile |
| 1168.40 | 60.00 | -236.1 | 1 (180)  2 (180) | Profile |
| 1859.20 | 55.05 | -236.1 | 1 (0)  2 (0)  3 (0)  4 (0) | Profile |
| 1879.20 | 6.20 | -236.1 | 1 (0) | Profile |
| 1904.20 | 71.20 | -236.1 | 1 (0)  2 (0)  3 (0)  4 (0) | Profile |

The following table provides a list of the profiles acquired on the F6 wing (no horn) at a pitch angle of 5.0 degrees. The data files are located in folder **F6\_AOA\_5** and the filenames follow the pattern: alpha5.0\_x\*\_z\*\_F6\_prof.dat. The parameter yo in the table denotes the y location of the fuselage surface. All of the profiles indicated in the table were acquired with the model upright (roll angle of 0 degrees).

|  |  |  |  |
| --- | --- | --- | --- |
| x (mm) | z (mm) | yo (mm) | File Type |
| 1168.40 | -59.00 | -236.1 | Profile |
| 1168.40 | -30.00 | -236.1 | Profile |
| 1168.40 | 0.00 | -236.1 | Profile |
| 1168.40 | 30.00 | -236.1 | Profile |
| 1168.40 | 60.00 | -236.1 | Profile |
|  |  |  |  |
| 1993.40 | 47.30 | -236.1 | Profile |
| 1998.40 | 46.90 | -236.1 | Profile |
| 2001.20 | 46.50 | -236.1 | Profile |
| 2004.00 | 46.20 | -236.1 | Profile |
| 2009.00 | 45.70 | -236.1 | Profile |
|  |  |  |  |
| 1983.40 | 93.30 | -236.1 | Profile |
| 1993.40 | 93.30 | -236.1 | Profile |
| 1998.40 | 93.30 | -236.1 | Profile |
| 2003.40 | 93.30 | -236.1 | Profile |
| 2008.40 | 93.30 | -236.1 | Profile |
| 2018.40 | 93.30 | -236.1 | Profile |
| 2023.40 | 93.30 | -236.1 | Profile |
| 2028.40 | 93.30 | -236.1 | Profile |
| 2033.40 | 93.30 | -236.1 | Profile |
| 2038.40 | 93.30 | -236.1 | Profile |
| 2043.40 | 93.30 | -236.1 | Profile |
| 2048.40 | 93.30 | -236.1 | Profile |
| 2053.40 | 93.30 | -236.1 | Profile |
| 2058.40 | 93.30 | -236.1 | Profile |
| 2063.40 | 93.30 | -236.1 | Profile |
| 2093.40 | 93.30 | -236.1 | Profile |

The following table provides a list of REPEAT profiles acquired on the F6 wing (no horn) at a pitch angle of 5.0 degrees. The data files are located in folder **F6\_AOA\_5\_Repeats** and the filenames follow the pattern: alpha5.0\_x\*\_z\*\_F6\_prof\_rep\*.dat. The parameter yo in the table denotes the y location of the fuselage surface. The rep\* part of the filename denotes the repeat index, and the table denotes whether a repeat was taken with the model upright (roll angle of 0 deg) or with the model inverted (roll angle of 180 deg).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x (mm) | z (mm) | yo (mm) | rep & (roll angle, deg) | File Type |
| 1168.40 | -30.00 | -236.1 | 1 (0) | Profile |
| 1168.40 | 0.00 | -236.1 | 1 (0)  2 (0)  3 (0) | Profile |
| 1168.40 | 30.00 | -236.1 | 1 (0) | Profile |
| 1168.40 | 60.00 | -236.1 | 1 (0) | Profile |
| 2009.00 | 45.70 | -236.1 | 1 (0) | Profile |