**Data Release for LDV Probe 2**

**October 29, 2020**

Each of the LDV data files contains 49 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 are two types of data files contained in the data package: the \*\_prof.dat files contain profiles that were acquired by surveying the flow field in the Z direction at a fixed X and Y location. In this case, the zone label specifies the X and Y location of the survey. The \*\_plane.dat files contain Y-Z planes of data that were acquired at a fixed X location and here, the planes were obtained by surveying the flow field in the Z direction at several closely spaced Y locations. In this case, the zone label specifies the X location of the planar survey and also denotes what type of planar survey was performed. The “full plane” label refers to a survey region that extends 30 mm out from the fuselage surface and approximately 30 mm above the wing surface at each Y location in the survey. The “partial plane” label refers to a survey region that extends 10 mm out from the fuselage surface and approximately 10 mm above the wing surface at each Y location in 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.

Z\_Zo: denotes the Z location of each measurement point minus a reference location obtained from the model CAD geometry. For the profile data (\*\_prof.dat), this reference location is equal to the Z location of the wing surface at the given X and Y. For the planar data (\*\_plane.dat), this reference location is equal to the Z location of the wing surface for the given X location and at Y = -239.1 mm.

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 and planar data 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: alpham2.5\_x\*\_ym\*\_F6h\_prof.dat or alpham2.5\_x\*\_F6h\_plane.dat, depending on whether the file contains a profile or a plane.

|  |  |  |  |
| --- | --- | --- | --- |
| x (mm) | y (mm) | zo (mm) | File Type |
| 2747.6 | n/a | 17.06 at y = -239.1 | Full plane |
|  |  |  |  |
| 2757.6 | -237.1 | 14.55 | Profile |
| 2757.6 | -239.1 | 14.88 | Profile |
| 2757.6 | -241.1 | 15.19 | Profile |
| 2757.6 | -246.1 | 15.98 | Profile |
| 2757.6 | -266.1 | 19.13 | Profile |
|  |  |  |  |
| 2781.6 | n/a | 9.54 at y = -239.1 | Partial plane |
|  |  |  |  |
| 2815.6 | n/a | 1.55 at y = -239.1 | Partial plane |
|  |  |  |  |
| 2849.6 | n/a | -7.31 at y = -239.1 | Partial plane |
|  |  |  |  |
| 2869.6 | -237.1 | -13.36 | Profile |
| 2869.6 | -239.1 | -13.03 | Profile |
|  |  |  |  |
| 2875.6 | -237.1 | -15.16 | Profile |
| 2875.6 | -238.1 | -15.01 | Profile |
| 2875.6 | -239.1 | -14.83 | Profile |
| 2875.6 | -246.1 | -13.67 | Profile |
| 2875.6 | -266.1 | -10.31 | Profile |
|  |  |  |  |
| 2881.6 | -237.1 | -17.02 | Profile |
| 2881.6 | -239.1 | -16.69 | Profile |
|  |  |  |  |
| 2887.6 | n/a | -18.57 at y = -239.1 | Full plane |
| 2887.6 | -237.1 | -18.90 | Profile |
| 2887.6 | -238.1 | -18.75 | Profile |
| 2887.6 | -239.1 | -18.57 | Profile |
| 2887.6 | -241.1 | -18.24 | Profile |
| 2887.6 | -246.1 | -17.37 | Profile |
|  |  |  |  |
| 2899.6 | -237.1 | -22.78 | Profile |
| 2899.6 | -238.1 | -22.61 | Profile |
| 2899.6 | -239.1 | -22.45 | Profile |
| 2899.6 | -241.1 | -22.10 | Profile |
| 2899.6 | -246.1 | -21.26 | Profile |
| 2899.6 | -256.1 | -19.56 | Profile |
|  |  |  |  |
| 2911.6 | -237.1 | -26.80 | Profile |
| 2911.6 | -238.1 | -26.62 | Profile |
| 2911.6 | -239.1 | -26.47 | Profile |
| 2911.6 | -241.1 | -26.11 | Profile |
| 2911.6 | -246.1 | -25.25 | Profile |
| 2911.6 | -256.1 | -23.55 | Profile |
|  |  |  |  |
| 2922.6 | n/a | -30.20 at y = -239.1 | Full plane |
| 2922.6 | -237.1 | -30.56 | Profile |
| 2922.6 | -239.1 | -30.20 | Profile |
| 2922.6 | -241.1 | -29.87 | Profile |
| 2922.6 | -246.1 | -29.01 | Profile |
| 2922.6 | -251.1 | -28.14 | Profile |
| 2922.6 | -256.1 | -27.28 | Profile |
|  |  |  |  |
| 2952.6 | -239.1 | -40.61 | Profile |
| 2952.6 | -241.1 | -40.26 | Profile |
| 2952.6 | -246.1 | -39.40 | Profile |
| 2952.6 | -251.1 | -38.53 | Profile |
| 2952.6 | -256.1 | -37.67 | Profile |
| 2952.6 | -266.1 | -35.92 | Profile |

The following table provides a list of the profiles and planar data 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\*\_ym\*\_F6h\_prof.dat or alpha5.0\_x\*\_F6h\_plane.dat, depending on whether the file contains a profile or a plane.

|  |  |  |  |
| --- | --- | --- | --- |
| x (mm) | y (mm) | zo (mm) | File Type |
| 2747.6 | n/a | 17.06 at y = -239.1 | Full plane |
| 2747.6 | -237.1 | 16.75 | Profile |
| 2747.6 | -239.1 | 17.06 | Profile |
| 2747.6 | -246.1 | 18.16 | Profile |
| 2747.6 | -266.1 | 21.30 | Profile |
|  |  |  |  |
| 2768.6 | n/a | 12.45 at y = -239.1 | Partial plane |
|  |  |  |  |
| 2789.6 | n/a | 7.71 at y = -239.1 | Partial plane |
|  |  |  |  |
| 2800.6 | n/a | 5.16 at y = -239.1 | Partial plane |
|  |  |  |  |
| 2811.6 | n/a | 2.53 at y = -239.1 | Partial plane |
|  |  |  |  |
| 2822.6 | -237.1 | -0.51 | Profile |
| 2822.6 | -239.1 | -0.20 | Profile |
|  |  |  |  |
| 2832.6 | -236.6 | -3.15 | Profile |
| 2832.6 | -237.1 | -3.07 | Profile |
| 2832.6 | -239.1 | -2.74 | Profile |
| 2832.6 | -241.1 | -2.44 | Profile |
| 2832.6 | -246.1 | -1.60 | Profile |
| 2832.6 | -266.1 | 1.65 | Profile |
|  |  |  |  |
| 2842.6 | -237.1 | -5.72 | Profile |
| 2842.6 | -239.1 | -5.41 | Profile |
|  |  |  |  |
| 2852.6 | n/a | -8.14 at y = -239.1 | Full plane |
| 2852.6 | -236.6 | -8.56 | Profile |
| 2852.6 | -237.1 | -8.46 | Profile |
| 2852.6 | -239.1 | -8.14\* | Profile |
| 2852.6 | -241.1 | -7.80 | Profile |
| 2852.6 | -246.1 | -6.99 | Profile |
| 2852.6 | -266.1 | -3.68 | Profile |
|  |  |  |  |
| 2872.6 | -236.6 | -14.33 | Profile |
| 2872.6 | -239.1 | -13.92 | Profile |
| 2872.6 | -241.1 | -13.59 | Profile |
| 2872.6 | -243.1 | -13.26 | Profile |
| 2872.6 | -246.1 | -12.75 | Profile |
| 2872.6 | -256.1 | -11.07 | Profile |
|  |  |  |  |
| 2892.6 | n/a | -20.17 at y = -239.1 | Full plane |
| 2892.6 | -237.1 | -20.50 | Profile |
| 2892.6 | -239.1 | -20.17 | Profile |
| 2892.6 | -246.1 | -18.97 | Profile |
| 2892.6 | -251.1 | -18.14 | Profile |
| 2892.6 | -256.1 | -17.30 | Profile |
| 2892.6 | -266.1 | -15.60 | Profile |
|  |  |  |  |
| 2922.6 | -237.1 | -30.56 | Profile |
| 2922.6 | -239.1 | -30.20 | Profile |
| 2922.6 | -246.1 | -29.01 | Profile |
| 2922.6 | -256.1 | -27.28 | Profile |
| 2922.6 | -266.1 | -25.55 | Profile |
| 2922.6 | -276.1 | -23.85 | Profile |
| 2922.6 | -286.1 | -22.12 | Profile |
|  |  |  |  |
| 2952.6 | -237.1 | -40.94 | Profile |
| 2952.6 | -239.1 | -40.61 | Profile |
| 2952.6 | -246.1 | -39.40 | Profile |
| 2952.6 | -256.1 | -37.67 | Profile |
| 2952.6 | -266.1 | -35.92 | Profile |
| 2952.6 | -286.1 | -32.44 | Profile |

The following table provides a list of the profiles and planar data acquired on the F6 wing with leading-edge horn at a pitch angle of 7.5 degrees. The data files are located in folder **F6\_Horn\_AOA\_7p5** and the filenames follow the pattern: alpha7.5\_x\*\_ym\*\_F6h\_prof.dat or alpha7.5\_x\*\_F6h\_plane.dat, depending on whether the file contains a profile or a plane.

|  |  |  |  |
| --- | --- | --- | --- |
| x (mm) | y (mm) | zo (mm) | File Type |
| 2747.6 | n/a | 17.06 at y = -239.1 | Full plane |
|  |  |  |  |
| 2769.6 | -239.1 | 12.23 | Profile |
|  |  |  |  |
| 2790.6 | n/a | 7.48 at y = -239.1 | Partial plane |
|  |  |  |  |
| 2811.6 | n/a | 2.53 at y = -239.1 | Partial plane |
| 2811.6 | -239.1 | 2.53 | Profile |
|  |  |  |  |
| 2826.6 | n/a | -1.20 at y = -239.1 | Partial plane |
|  |  |  |  |
| 2836.6 | n/a | -3.80 at y = -239.1 | Full plane |
|  |  |  |  |
| 2892.6 | n/a | -20.17 at y = -239.1 | Full plane |

The following table provides a list of the profiles and planar data 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\*\_ym\*\_F6\_prof.dat or alpha5.0\_x\*\_F6\_plane.dat, depending on whether the file contains a profile or a plane.

|  |  |  |  |
| --- | --- | --- | --- |
| x (mm) | y (mm) | zo (mm) | File Type |
| 2747.6 | -236.6 | 16.66 | Profile |
| 2747.6 | -237.1 | 16.76 | Profile |
| 2747.6 | -239.1 | 17.06\* | Profile |
| 2747.6 | -243.1 | 17.70 | Profile |
| 2747.6 | -246.1 | 18.16 | Profile |
| 2747.6 | -256.1 | 19.74 | Profile |
| 2747.6 | -286.1 | 24.43 | Profile |
|  |  |  |  |
| 2832.6 | -236.6 | -3.15 | Profile |
| 2832.6 | -237.1 | -3.07 | Profile |
| 2832.6 | -239.1 | -2.74 | Profile |
| 2832.6 | -241.1 | -2.44 | Profile |
| 2832.6 | -243.1 | -2.11 | Profile |
| 2832.6 | -246.1 | -1.60 | Profile |
| 2832.6 | -256.1 | 0.03 | Profile |
| 2832.6 | -286.1 | 4.90 | Profile |
|  |  |  |  |
| 2852.6 | -236.6 | -8.56 | Profile |
| 2852.6 | -237.1 | -8.46 | Profile |
| 2852.6 | -239.1 | -8.14\* | Profile |
| 2852.6 | -243.1 | -7.47 | Profile |
| 2852.6 | -246.1 | -6.99 | Profile |
| 2852.6 | -256.1 | -5.33 | Profile |
| 2852.6 | -286.1 | -0.38 | Profile |
|  |  |  |  |
| 2872.6 | -236.6 | -14.33 | Profile |
| 2872.6 | -237.1 | -14.25 | Profile |
| 2872.6 | -239.1 | -13.92 | Profile |
| 2872.6 | -241.1 | -13.59 | Profile |
| 2872.6 | -243.1 | -13.26 | Profile |
| 2872.6 | -246.1 | -12.75 | Profile |
| 2872.6 | -256.1 | -11.07 | Profile |
| 2872.6 | -266.1 | -9.42 | Profile |
| 2872.6 | -286.1 | -6.07 | Profile |
|  |  |  |  |
| 2892.6 | -236.6 | -20.60 | Profile |
| 2892.6 | -239.1 | -20.17 | Profile |
| 2892.6 | -241.1 | -19.84 | Profile |
| 2892.6 | -243.1 | -19.48 | Profile |
| 2892.6 | -246.1 | -18.97 | Profile |
| 2892.6 | -251.1 | -18.14 | Profile |
| 2892.6 | -256.1 | -17.30 | Profile |
| 2892.6 | -266.1 | -15.60 | Profile |
| 2892.6 | -286.1 | -12.22 | Profile |
|  |  |  |  |
| 2922.6 | -236.6 | -30.63 | Profile |
| 2922.6 | -239.1 | -30.20 | Profile |
| 2922.6 | -246.1 | -29.01 | Profile |
| 2922.6 | -256.1 | -27.28 | Profile |
| 2922.6 | -266.1 | -25.55 | Profile |
| 2922.6 | -286.1 | -22.12 | Profile |
|  |  |  |  |
| 2952.6 | -239.1 | -40.61 | Profile |
| 2952.6 | -246.1 | -39.40 | Profile |
| 2952.6 | -256.1 | -37.67 | Profile |
| 2952.6 | -266.1 | -35.92 | Profile |

\*Indicates minor change from March 19, 2019 number