

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_Z₀: 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 10^6 .

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 10^6 .

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: `alphan2.5_x*_ym*_F6h_prof.dat` or `alphan2.5_x*_F6h_plane.dat`, depending on whether the file contains a profile or a plane.

x (mm)	y (mm)	z _o (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)	z _o (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)	z _o (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)	z _o (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