



FX2B Design Reference

A Wing-Body Fairing Design for the DLR-F6 Model: A DPW-III Case Study

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FX2B Fairing Geometry
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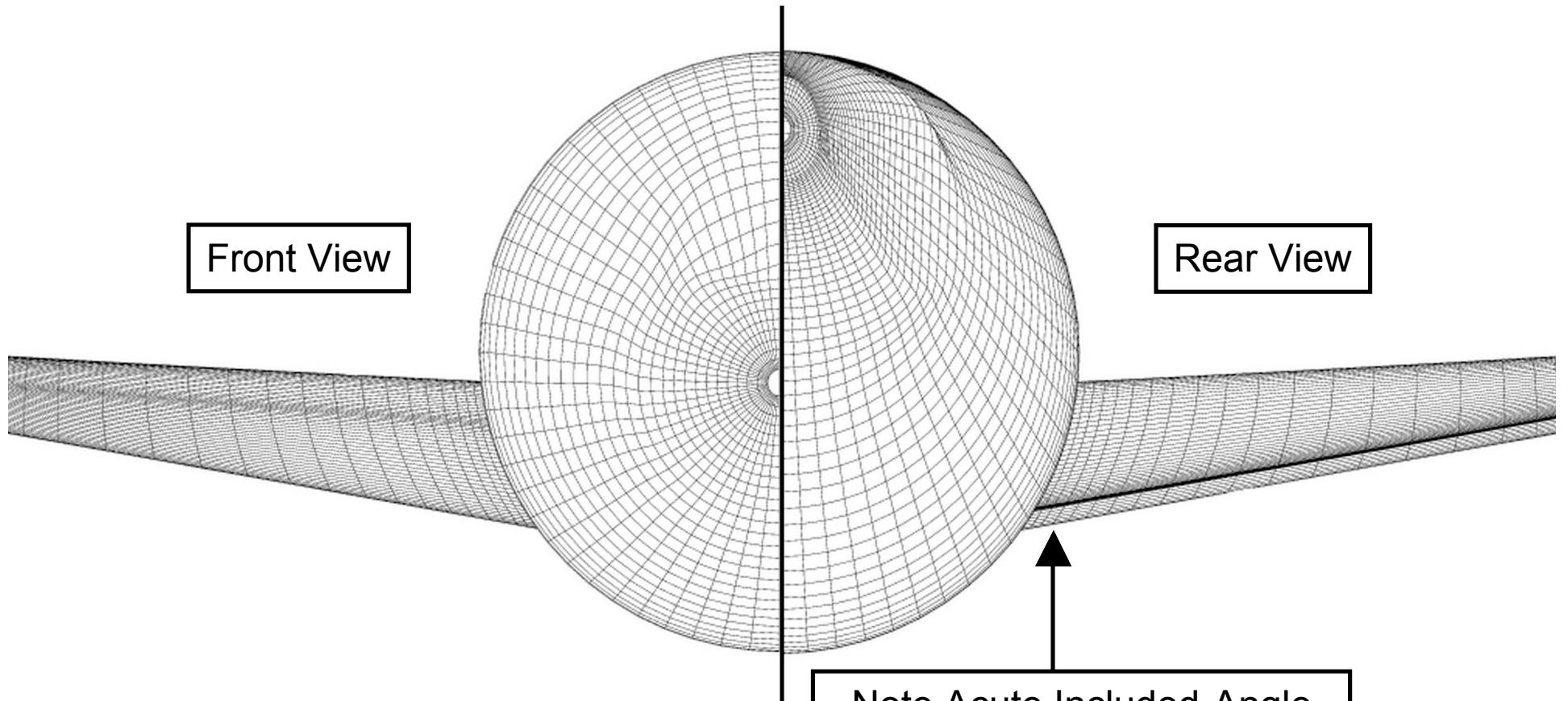


FX2B Design Objectives

- Eliminate Flow Separation at SOB
 - Based on OVERFLOW Solutions
 - $M=0.75$, $CL=0.5$, $Rn=3M$
 - Central-Difference & Baldwin-Barth
 - Worst-Case Scenario of Separation
- Retrofit Add-On Part to DLR-F6 Model
- Available to Public Domain
 - Not Based on a Proprietary Process
 - Not Constrained by Real-World Factors
 - Not a Drag Minimization Study



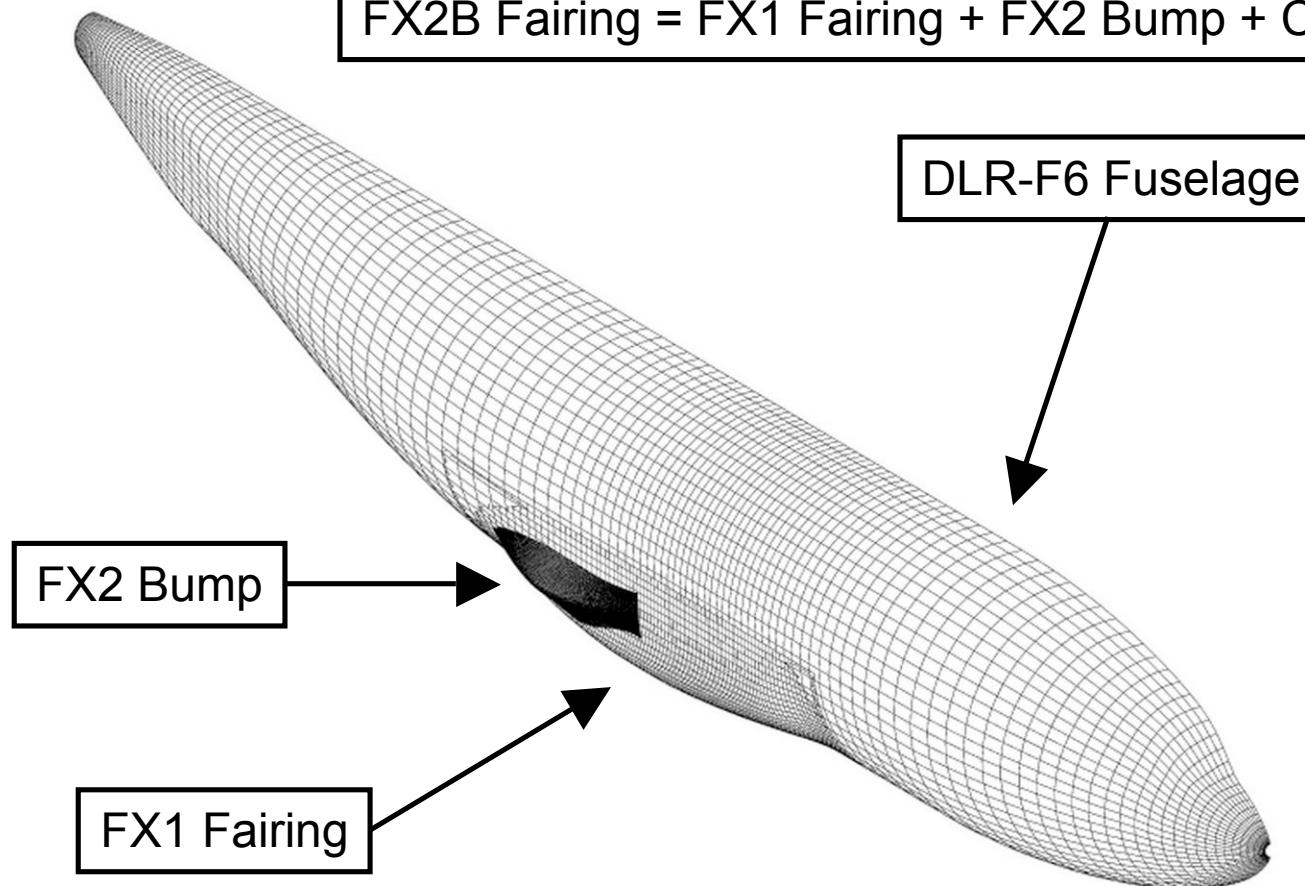
Baseline DLR-F6 WB





DLR-F6 Fuselage w/ FX2B

FX2B Fairing = FX1 Fairing + FX2 Bump + CATIA Fit



FX2B Fairing Geometry
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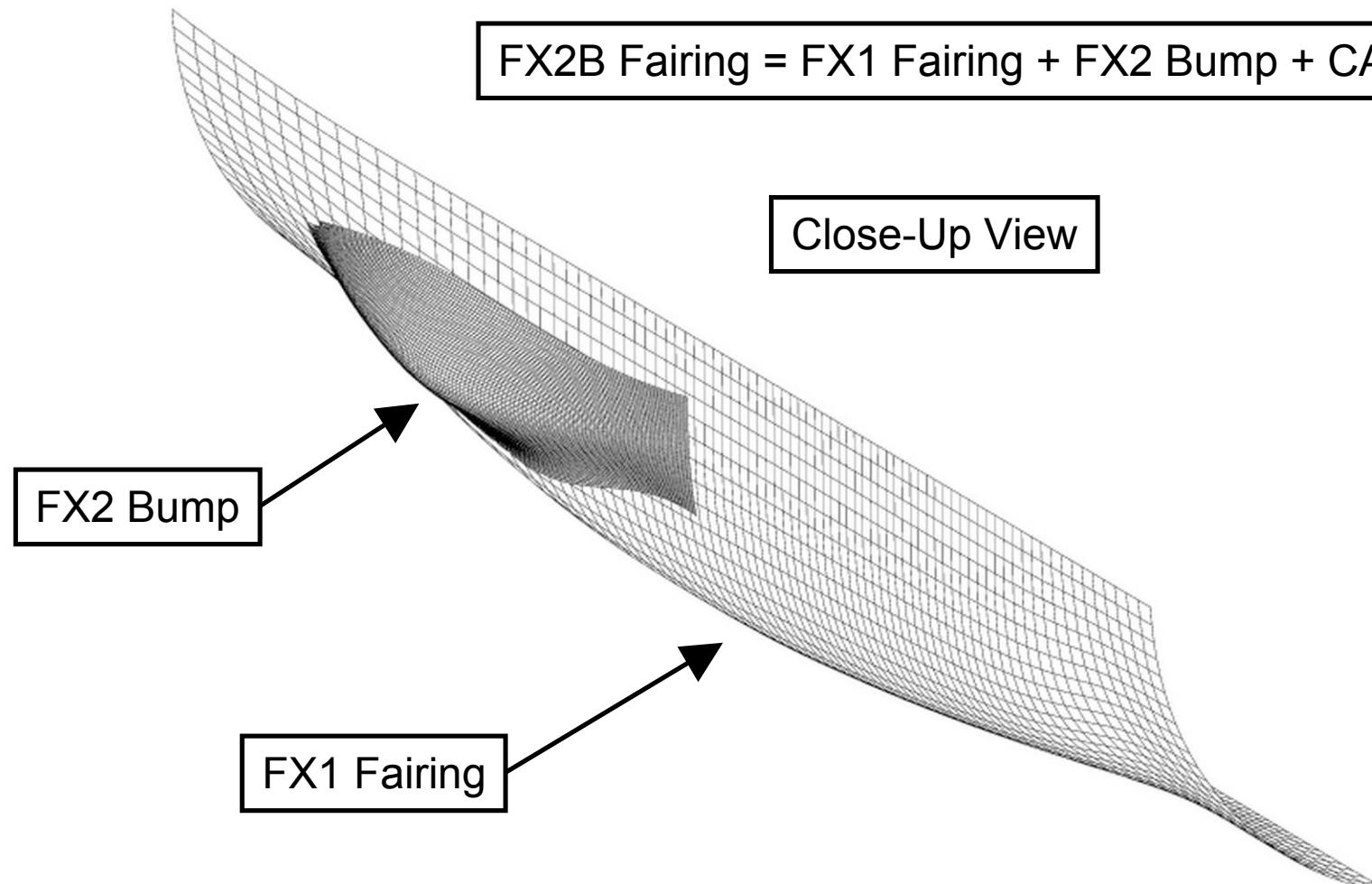




FX2B Fairing Geometry

FX2B Fairing = FX1 Fairing + FX2 Bump + CATIA Fit

Close-Up View



FX2B Fairing Geometry
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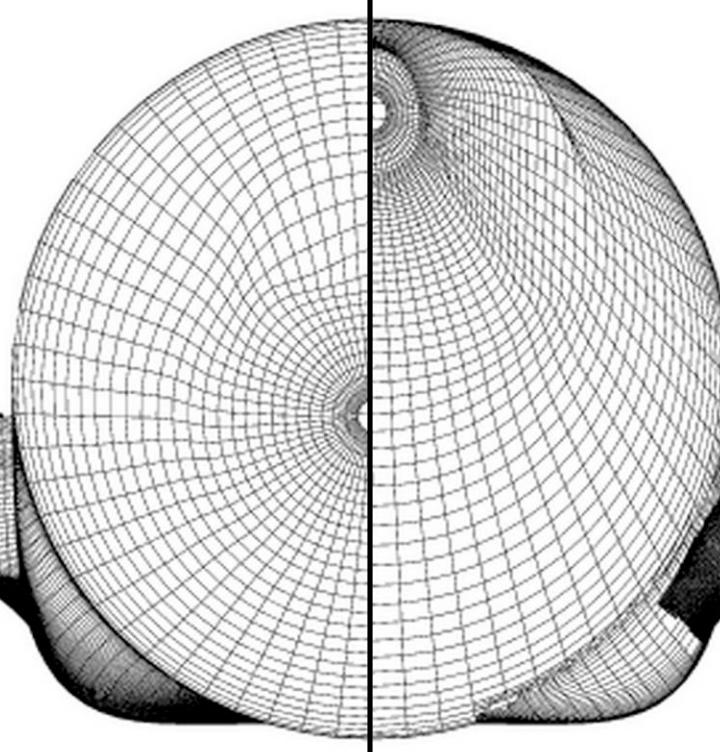




DLR-F6 WB w/ FX2B

Front View

Rear View



Top View

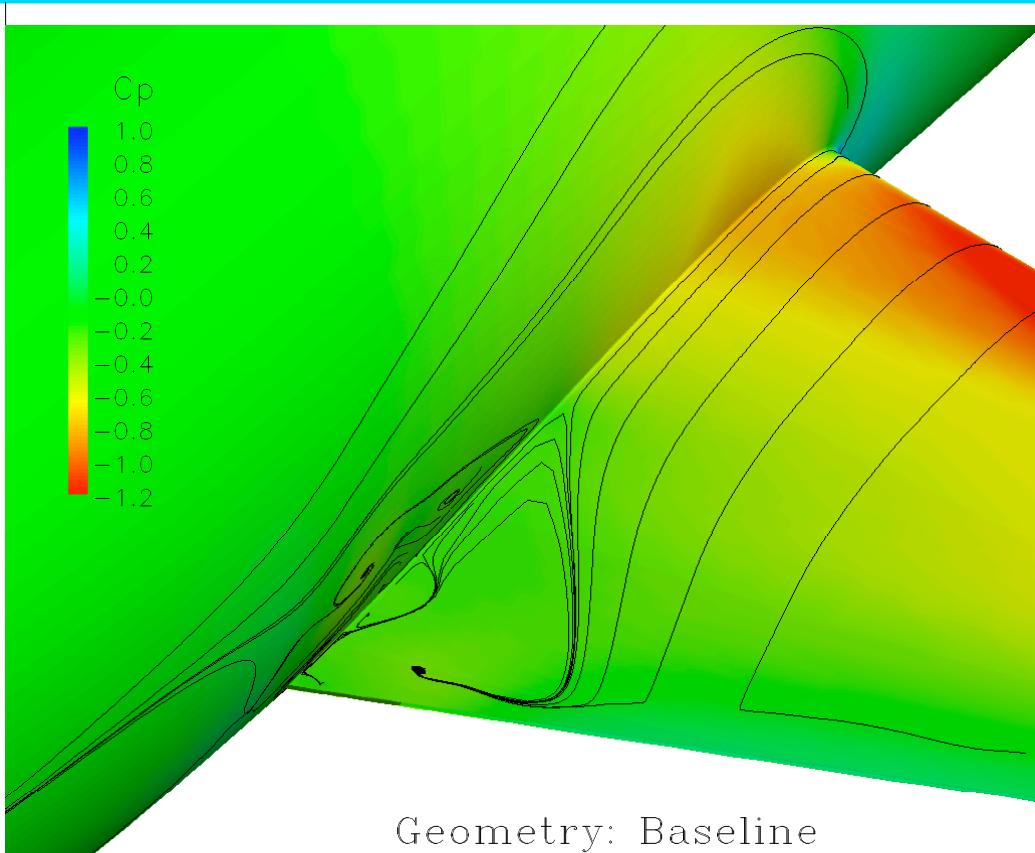


FX2B Fairing Geometry
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Baseline F6 w/o Fairing



Note Large
SOB Separation

OVERFLOW
Baldwin-Barth

Geometry: Baseline
RN = 3 million
Mach = 0.75
Alpha = 0.370 deg
CL = 0.501

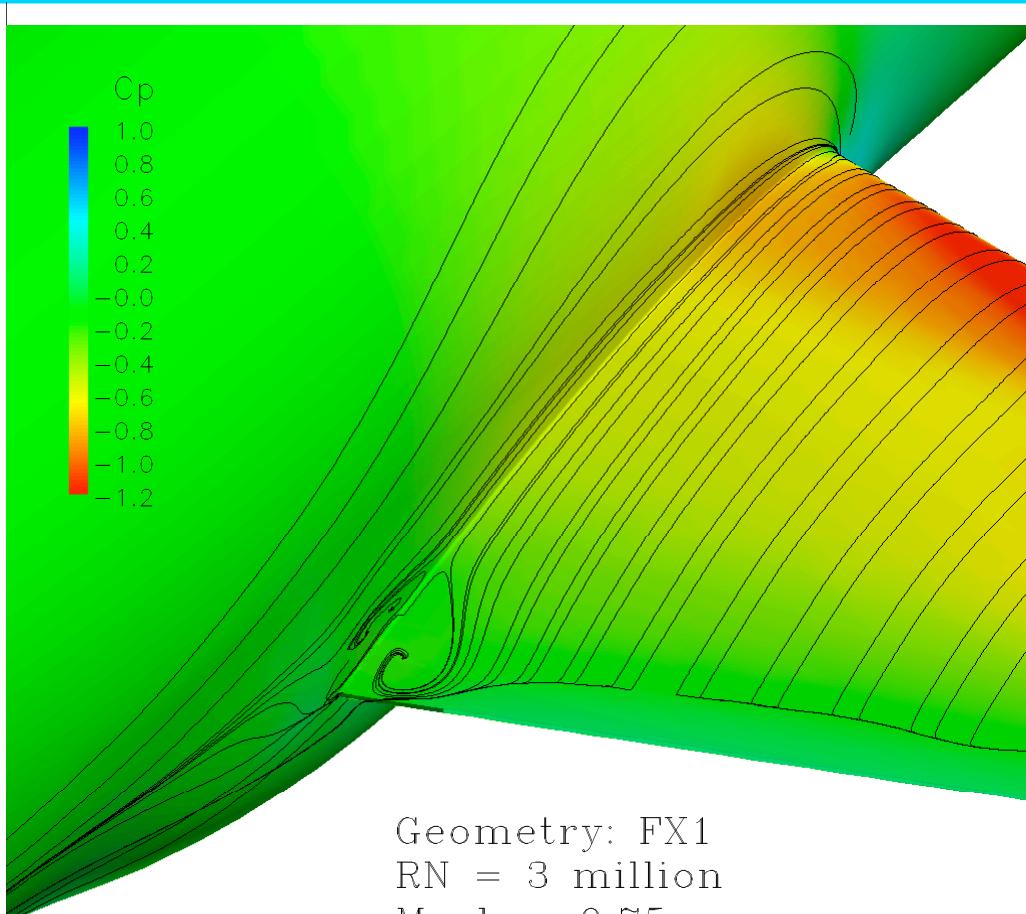


FX2B Fairing Geometry
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DLR-F6 w/ FX1 Fairing



SOB Separation
Greatly Reduced

OVERFLOW
Baldwin-Barth

Geometry: FX1
RN = 3 million
Mach = 0.75
Alpha = 0.118 deg
CL = 0.501

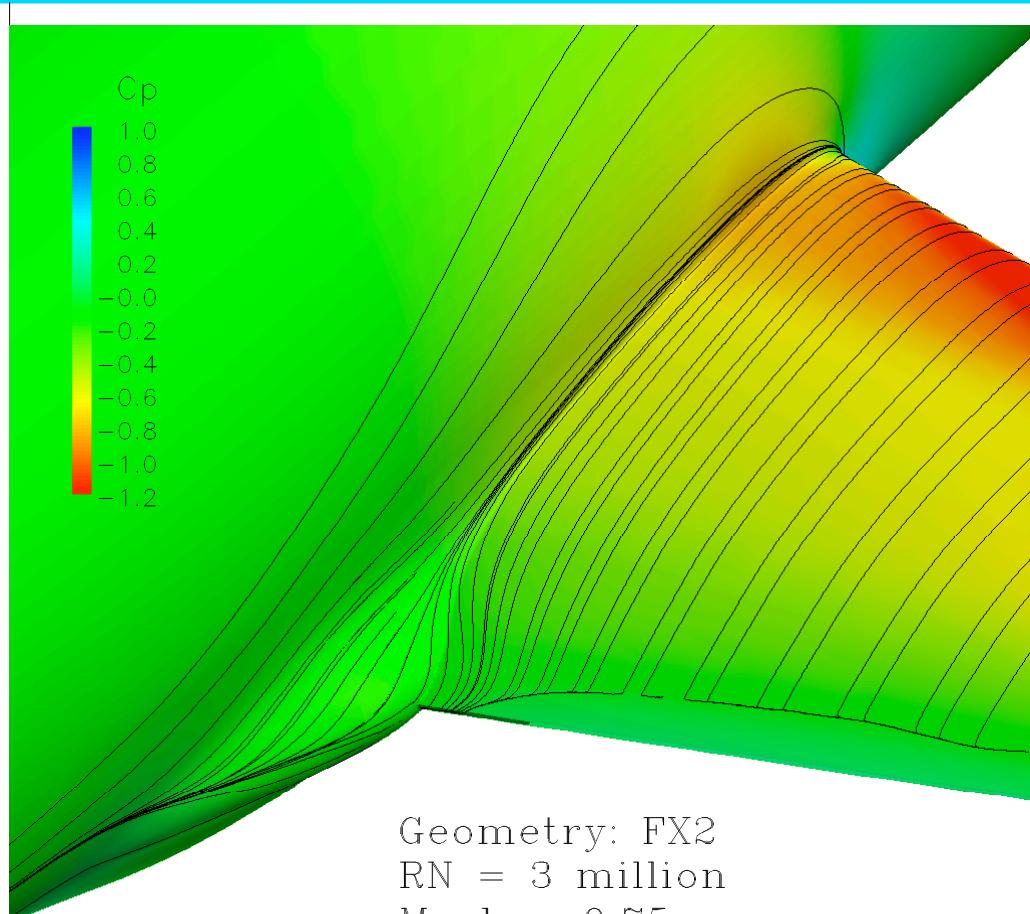


FX2B Fairing Geometry
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DLR-F6 w/ FX2B Fairing



FX2B Fairing Geometry
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DLR-F6 Wing-Body

Surface Streamlines – Side of Body Flow

Medium Grid, Mach = 0.75, $C_L = 0.50$, $R_N = 5.0$ million, Fully Turbulent, SA

