

# Test Case 2a(E): Wing/Body Deformation (cruise)

- CFD/FEM start from unloaded (wind-off) geometry/grid

- CRM Wing/Body

- Reynolds number: 5M (LoQ)
- Dynamic Pressure:  $Q_\infty = 1384$  psf
- Mach number: 0.85 ( $M_{\text{cruise}}$ )
- CL = 0.5000 +/- 0.0001 (Angle of Attack ~ 2.75 deg)
- Temperature: 120.0 F (579.67 R / 322.04 K)
- Reference Information: <https://aiaa-dpw.larc.nasa.gov/Workshop7/DPW7-geom.html>

**Grid: Level 1-6**

## Comparison Data

NTF197: r44,r51,r53  
NTF197: r92,r97,r99 (WBTO)  
NTF215: r43,r103  
NTF229: r296,r300,r302  
ETW ESWIRP: r164,r182,r153  
Ames216: r35,r126,r130,r133

- Committee-supplied

- NASA CRM geometry in jig/unloaded condition
  - Trip location – Wing: 10% chord upper/lower surface
- Grid Family: [https://dpw.larc.nasa.gov/DPW8/Static\\_Deformation/Test\\_Case\\_2](https://dpw.larc.nasa.gov/DPW8/Static_Deformation/Test_Case_2)
  - L1: Tiny/L2: Coarse/L3: Medium/L4: Fine/L5: eXtra-fine/L6: Ultra-fine
- NASA CRM finite-element model: [https://dpw.larc.nasa.gov/DPW8/Static\\_Deformation/Test\\_Case\\_2/FEM\\_Models](https://dpw.larc.nasa.gov/DPW8/Static_Deformation/Test_Case_2/FEM_Models)

## Measured Span Stations

$\eta = (0.00, 0.4286, 0.5546, 0.6773, 0.7954, 0.9150)$

- Comparison metrics

- Forces / Moments
- Sectional Twist / Deformation
- Sectional  $C_p$  distribution
- Residuals (Flow & Structural Solver)

# Test Case 2b(E): Wing/Body Deformation (polar)

- CFD/FEM start from unloaded (wind-off) geometry/grid

- CRM Wing/Body

- Reynolds number: 5M (LoQ)
- Dynamic Pressure:  $Q_\infty = 1384$  psf
- Mach number: 0.85 ( $M_{\text{cruise}}$ )
- Angles of attack: -1.50, 0.00, 1.50, **2.50**, 3.00, **3.50**, 4.00, 4.50
- Temperature: 120.0 F (579.67 R / 322.04 K)
- Reference Information: <https://aiaa-dpw.larc.nasa.gov/Workshop7/DPW7-geom.html>

Grid: Level 3  
**Grid: Level 1-6**

## Comparison Data

NTF197: r44,r51,r53  
NTF197: r92,r97,r99 (WBTO)  
NTF215: r43,r103  
NTF229: r296,r300,r302  
ETW ESWIRP: r164,r182,r153  
Ames216: r35,r126,r130,r133

- Committee-supplied

- NASA CRM geometry in jig/unloaded condition
  - Trip location – Wing: 10% chord upper/lower surface
- Grid Family: [https://dpw.larc.nasa.gov/DPW8/Static\\_Deformation/Test\\_Case\\_2](https://dpw.larc.nasa.gov/DPW8/Static_Deformation/Test_Case_2)
  - L1:Tiny/L2:Coarse/L3:Medium/L4:Fine/L5:eXtra-fine/L6:Ultra-fine
- NASA CRM finite-element model: [https://dpw.larc.nasa.gov/DPW8/Static\\_Deformation/Test\\_Case\\_2/FEM\\_Models](https://dpw.larc.nasa.gov/DPW8/Static_Deformation/Test_Case_2/FEM_Models)

## Measured Span Stations

$\eta = (0.00, 0.4286, 0.5546, 0.6773, 0.7954, 0.9150)$

- Comparison metrics

- Forces / Moments
- Sectional  $C_p$  distribution
- Sectional Twist / Deformation
- Residuals (Flow & Structural Solver)