Lateral-Directional Active Flow Control on a Hybrid ICE-101/Saccon UCAV

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Setup

CFD description

CFD code

- HPCMP CREATE-AV™/Kestrel
- Cell-centered finite volume
- Compressible Navier-Stokes equations
- 2nd-order in space and time
- SARC turbulence model

Grid

- Geometry with 6 forcing slots
- 71M cells
- \( y^+ < 1 \)

Forcing

- Source boundary condition
- \( c_\mu = 0.005 \)
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Simulations

Results

Comparison Unforced - Apex Forcing

Unforced

Unforced

Apex Forcing

Apex Forcing
Comparison Unforced - Midspan Forcing

Unforced

\[ \alpha = +12 \text{deg} \]
\[ \beta = +0 \text{deg} \]

Midspan Forcing

\[ \alpha = +28 \text{deg} \]
\[ \beta = +0 \text{deg} \]
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Simulations

Results

Comparison Unforced - Combined Forcing

Unforced

\[ \alpha = +12 \text{deg} \]
\[ \beta = +00 \text{deg} \]

Combined Forcing

\[ \alpha = +12 \text{deg} \]
\[ \beta = +00 \text{deg} \]
Comparison Unforced - Trailing Edge Forcing