

Stability Analysis of Range G 8 degree cone

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Stability Analysis

- STABL Stability Analysis

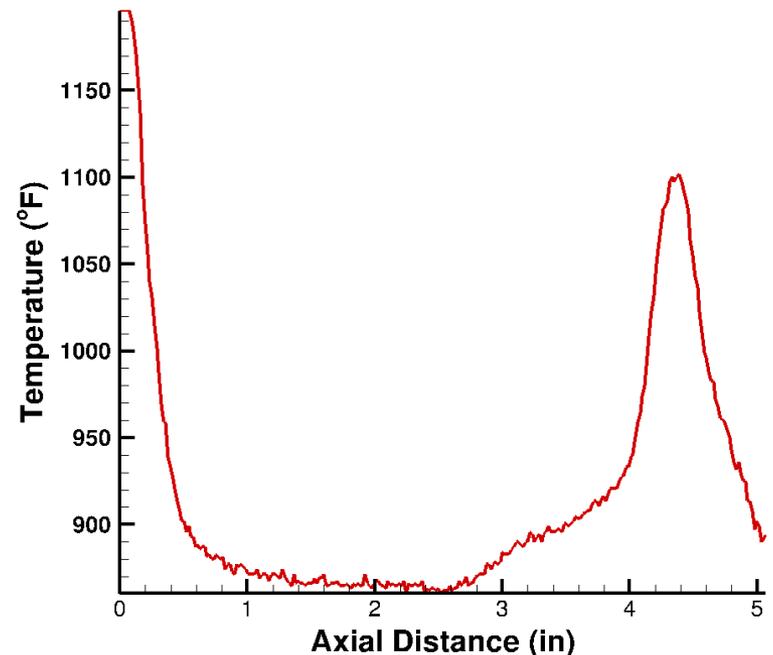
- Geometry: 0.045 inch nose radius, 5.069 inch, smooth, 8° half-angle cone

- Conditions:

- Velocity = 16400 fps
- Pressure = 50 torr
- Temperature = 75 °F

- CFD Model:

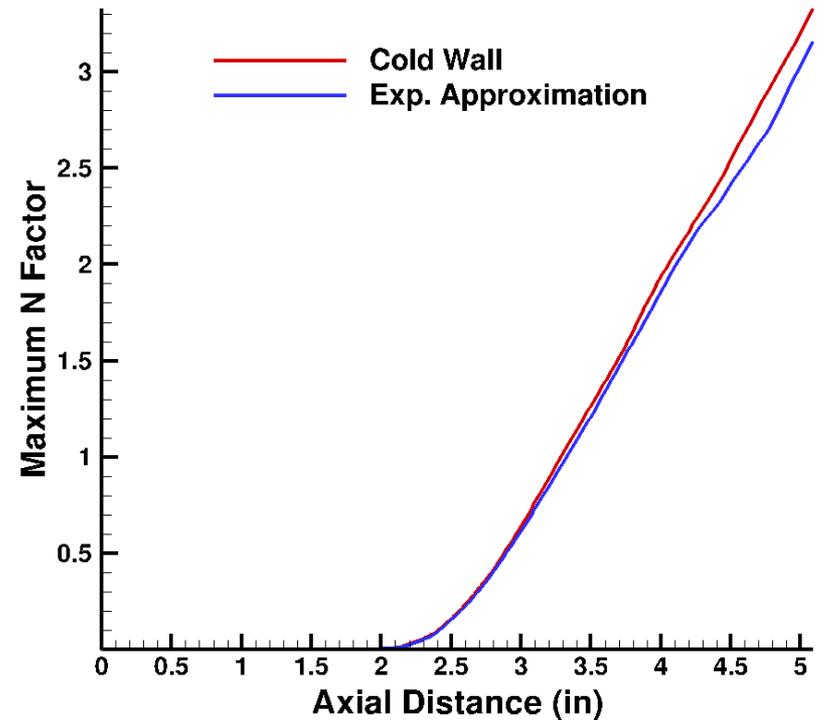
- 5 species-5 reaction air
- Two-temperature thermal non-equilibrium
- Two wall temperatures tested
 - 67 °F Cold Wall
 - Thermal image wall temperature



Extracted Wall Temperature Profile

Results

- Instabilities
 - Second Mode:
 - Max N @ L ~ 3.1
 - First Mode:
 - Not tested – edge Mach number is ≥ 4 and $T_w/T_{aw} < 0.1$
 - Both stabilizing of first mode



Extracted Wall Temperature Profile