# AePW-4 High-Angle Working Group Meeting


November 14, 2024

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# Agenda, November 14

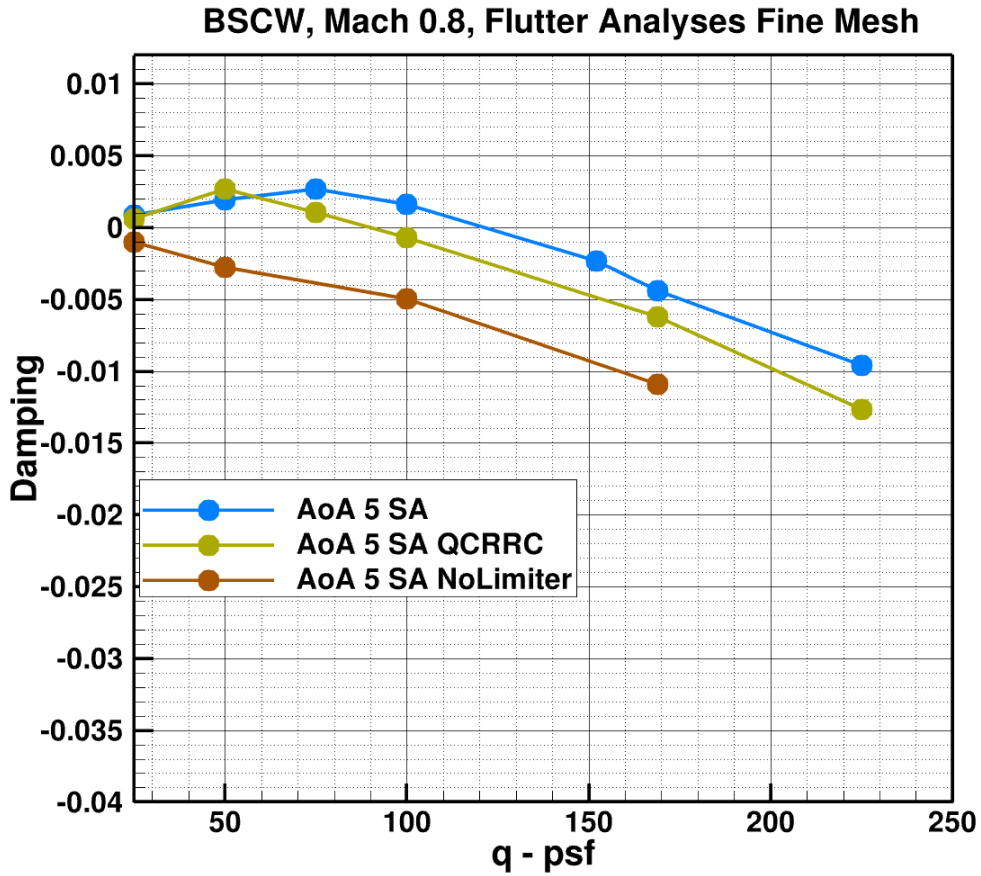
- November 8, DPW8-AePW4 joint meeting
- AIAA SciTech 2025: Orlando, FL, Mini Workshop 1, Thursday, January 9
- AIAA Aviation 2025 in-person meeting
- Summer 2025: New BSCW Experiment
- AePW-4 website: https://nescacademy.nasa.gov/workshops/AePW4/public
- Presentation today:
  - FUN3D flutter analysis status
- Next meeting, December 12
- AIAA Aviation 2026: DPW-8 and AePW-4 Workshop

# High Angle Working Group July 2022
# FUN3D BSCW flutter analysis at Mach 0.8, AoA = 5 deg

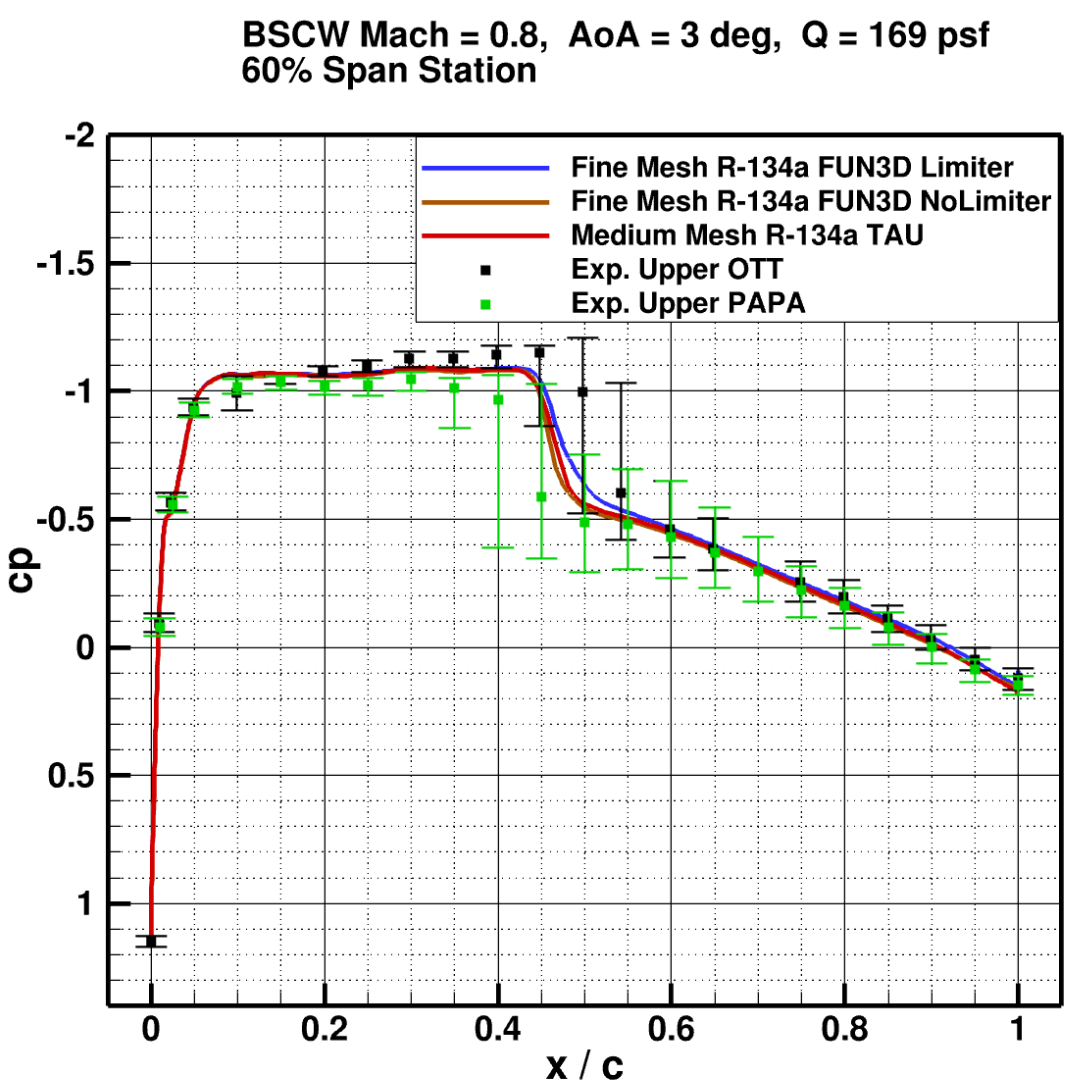
**Turbulence model: SA**
**Flux Limiter: No**

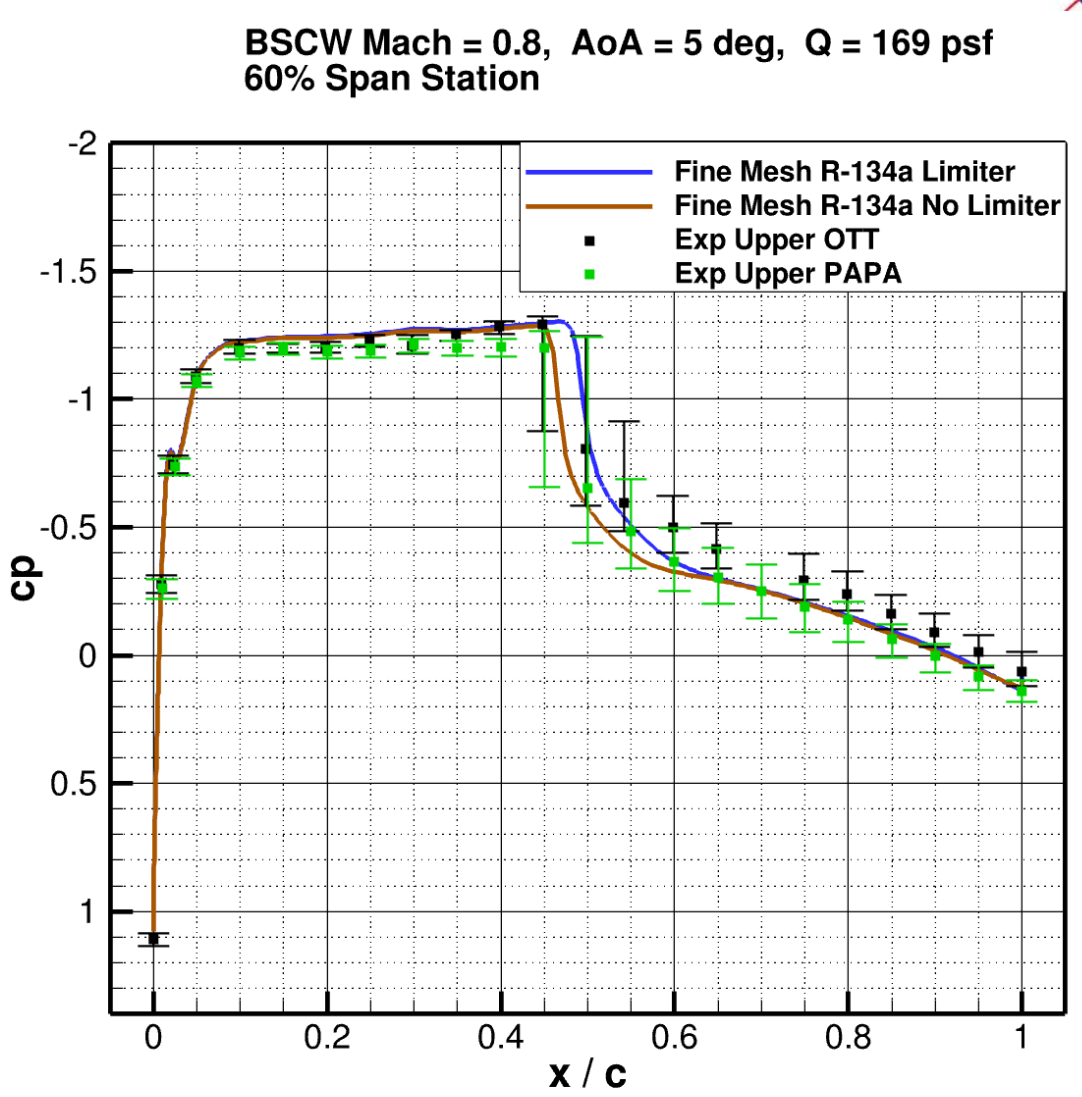
- **Very good convergence**
- **Shock is pushed toward leading edge**
- **Flutter solutions are always unstable (negative damping) - SA and DDES**

- **SA w/ compressibility correction?**

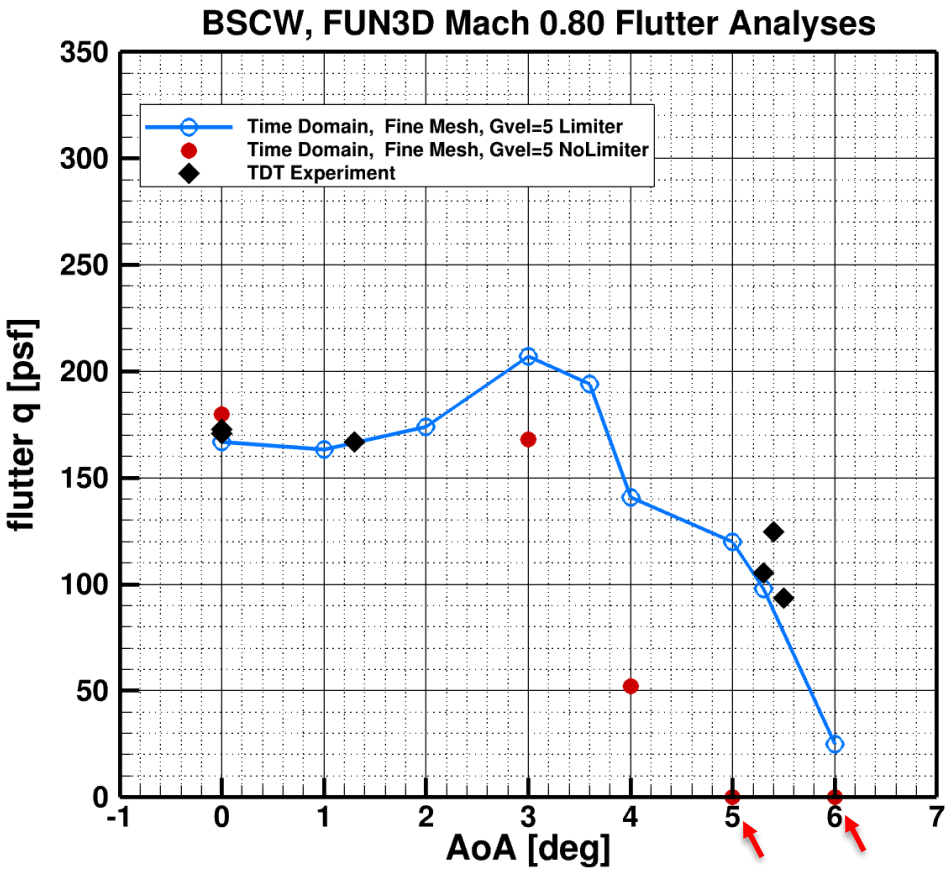


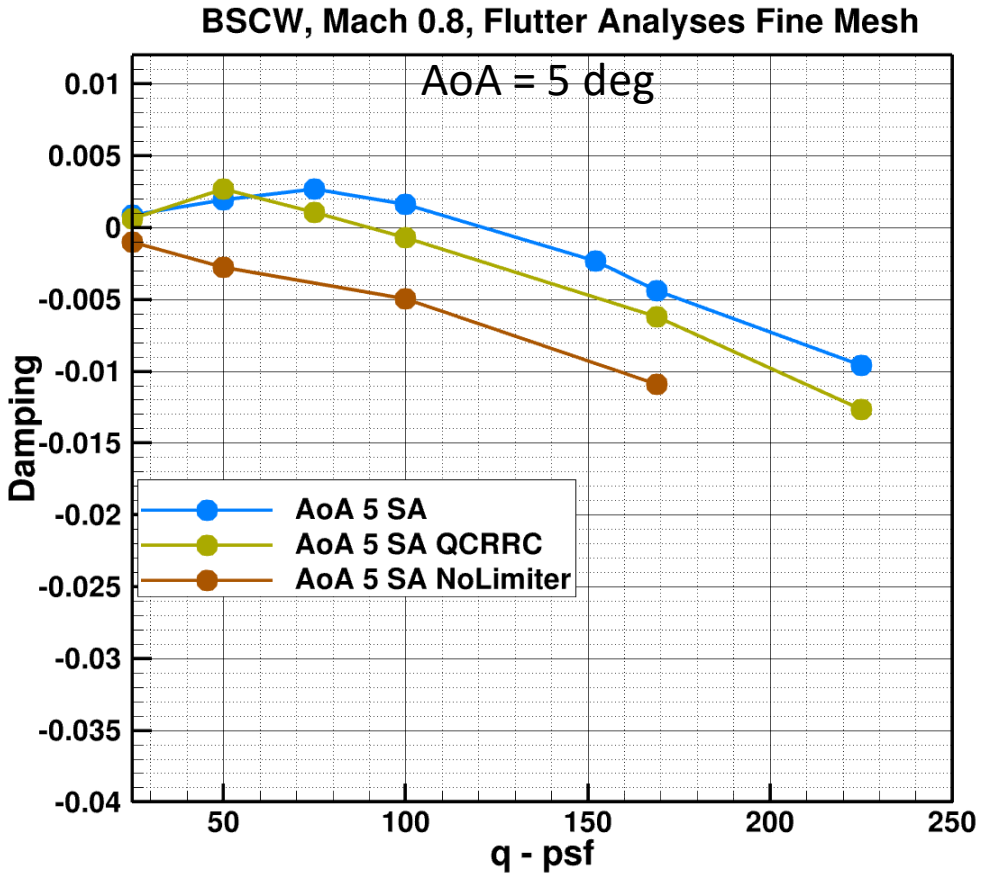
# Rigid Steady FUN3D SA with and without Venkat Limiter



# Flutter, FUN3D SA with and without Venkat Limiter




This only implies that flutter q cannot be computed

# 2D Analysis

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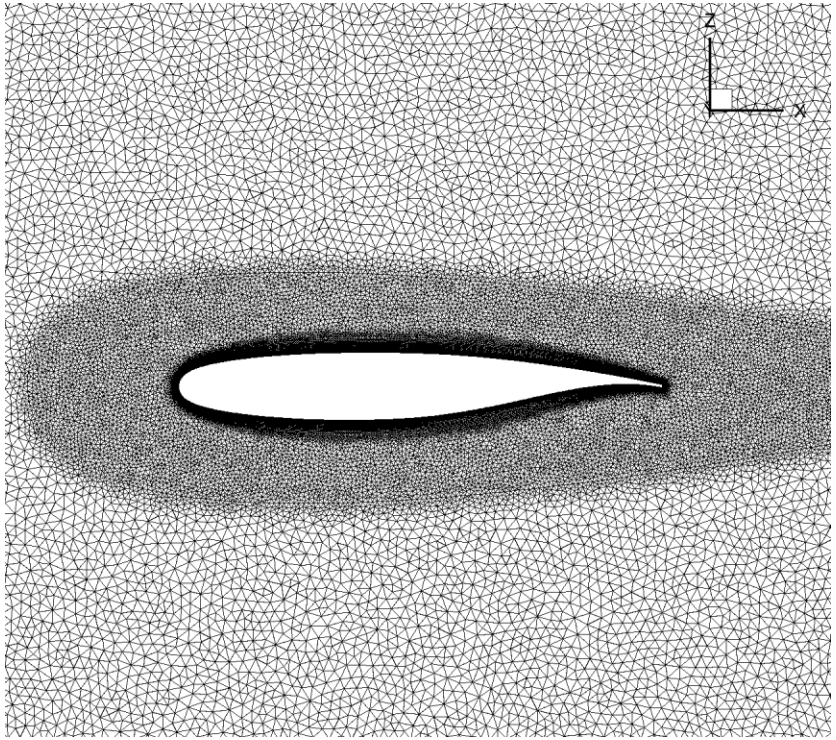


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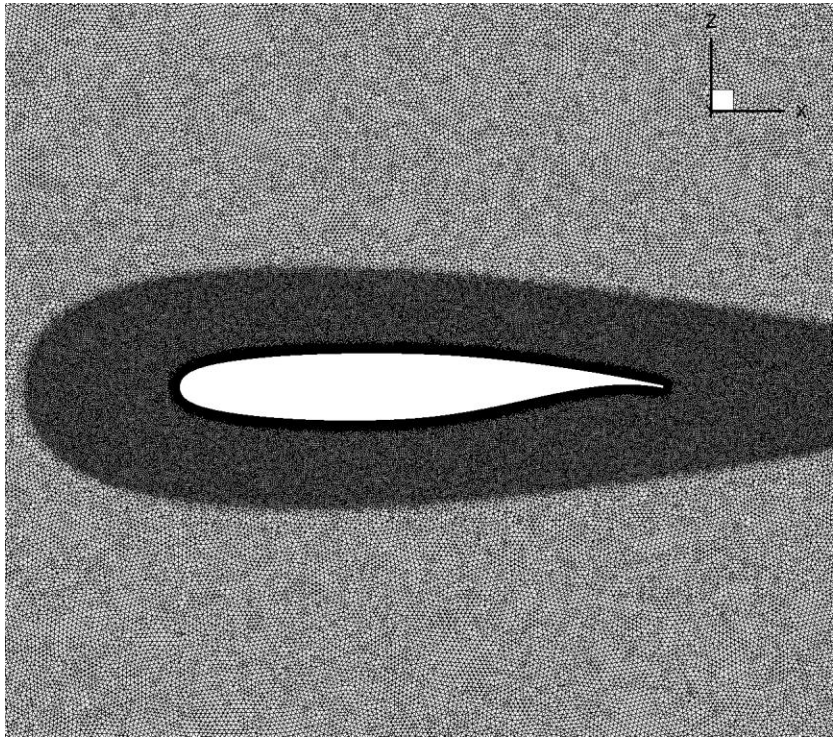


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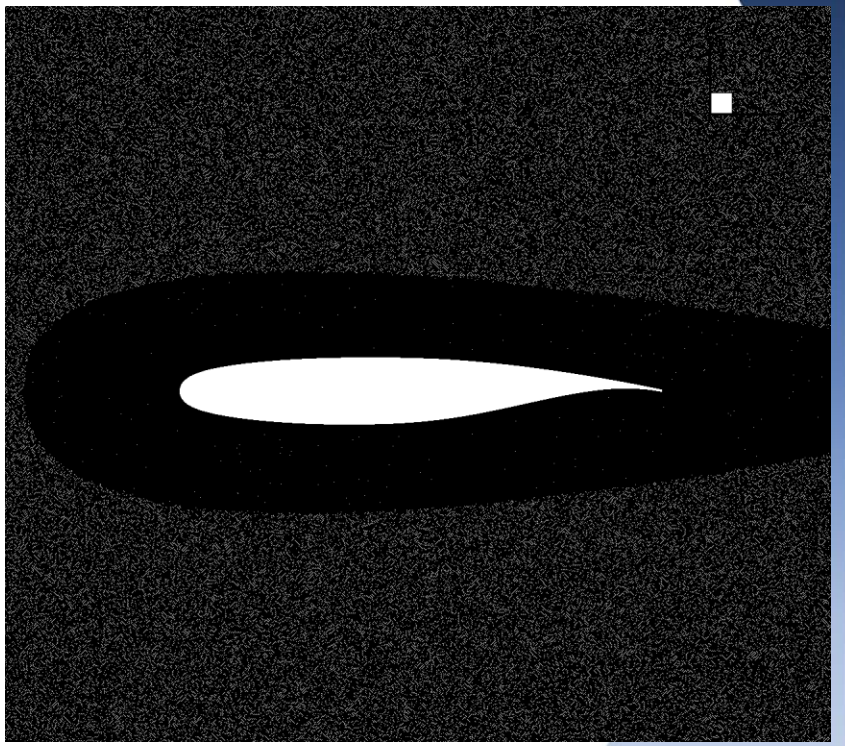
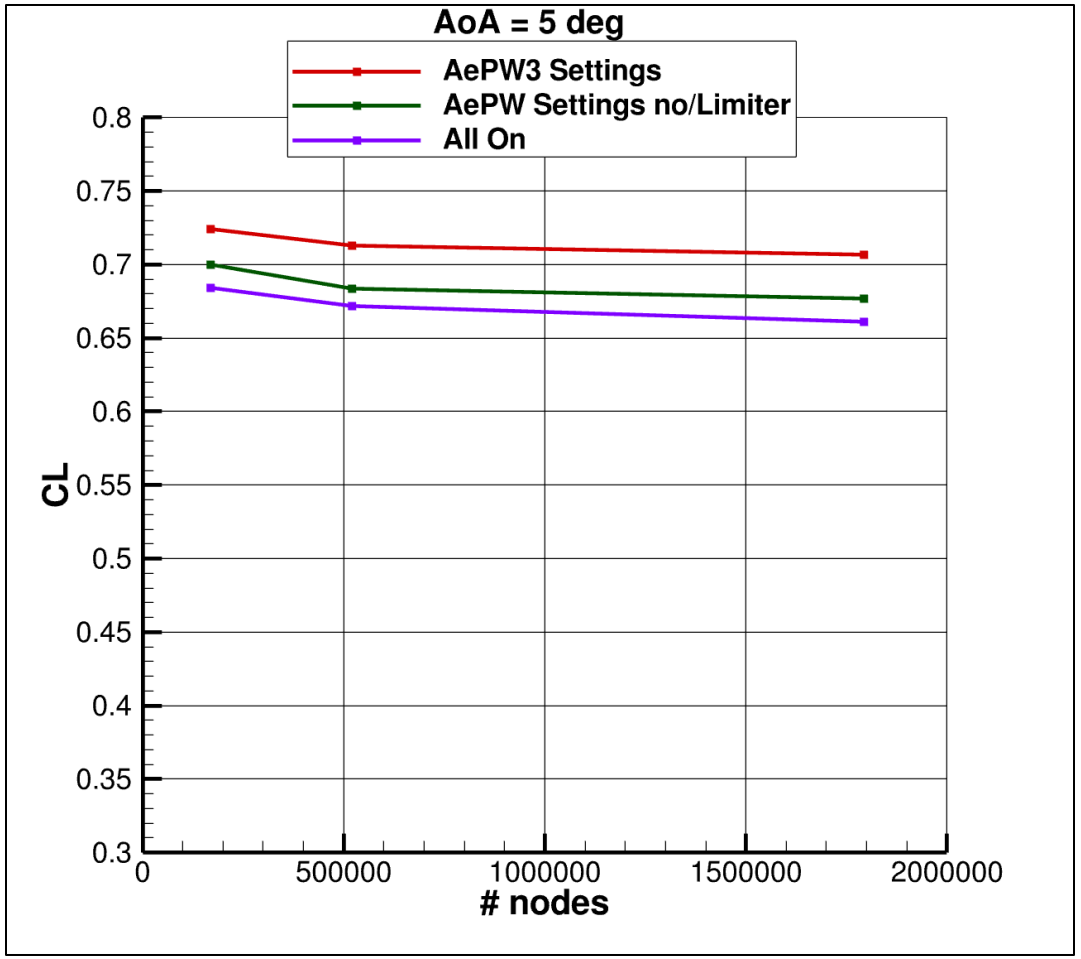
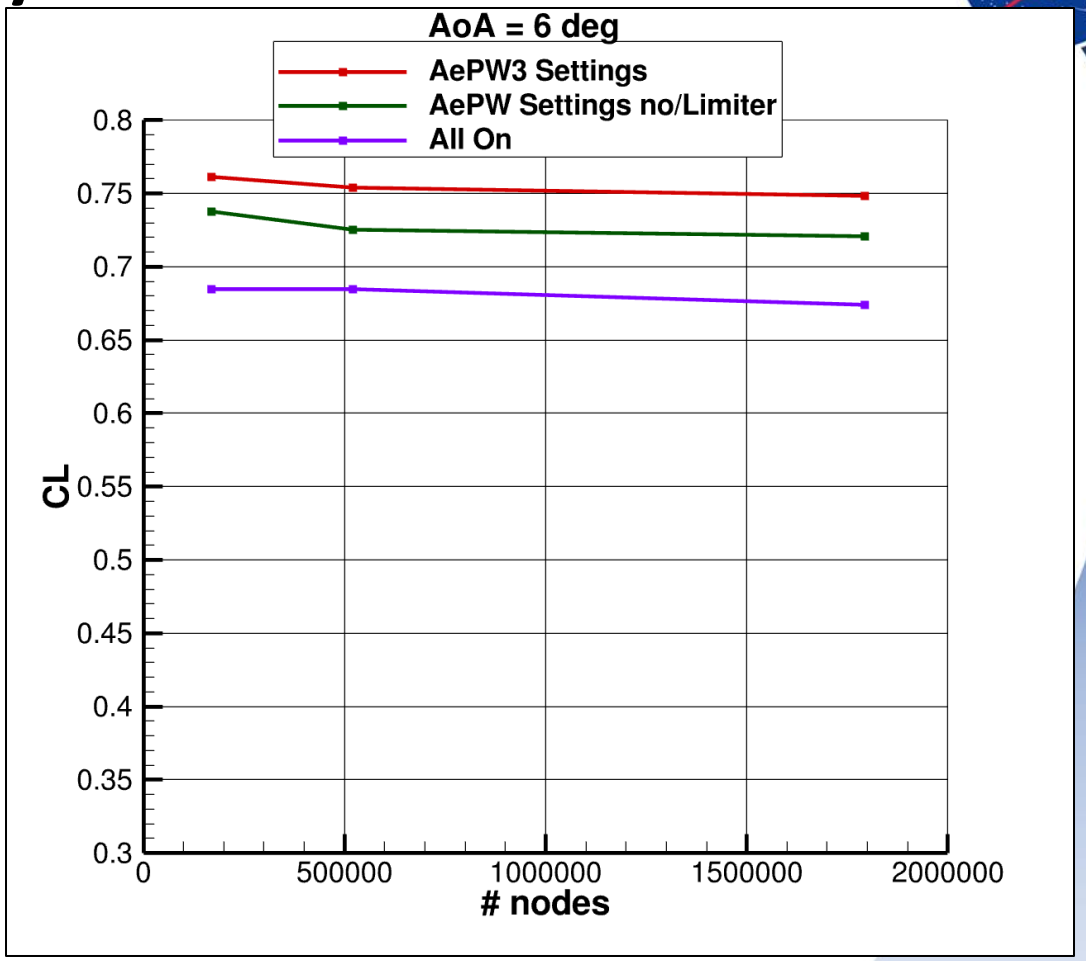


AePW-3 Settings: SA, w/Limiter
AePW-3 Settings: SA, no/Limiter
All Settings: SA-neg, QCR, RC, Compressibility Correction, 2nd order Turbulence, Frozen Limiter, Hanim

# 2D Analysis

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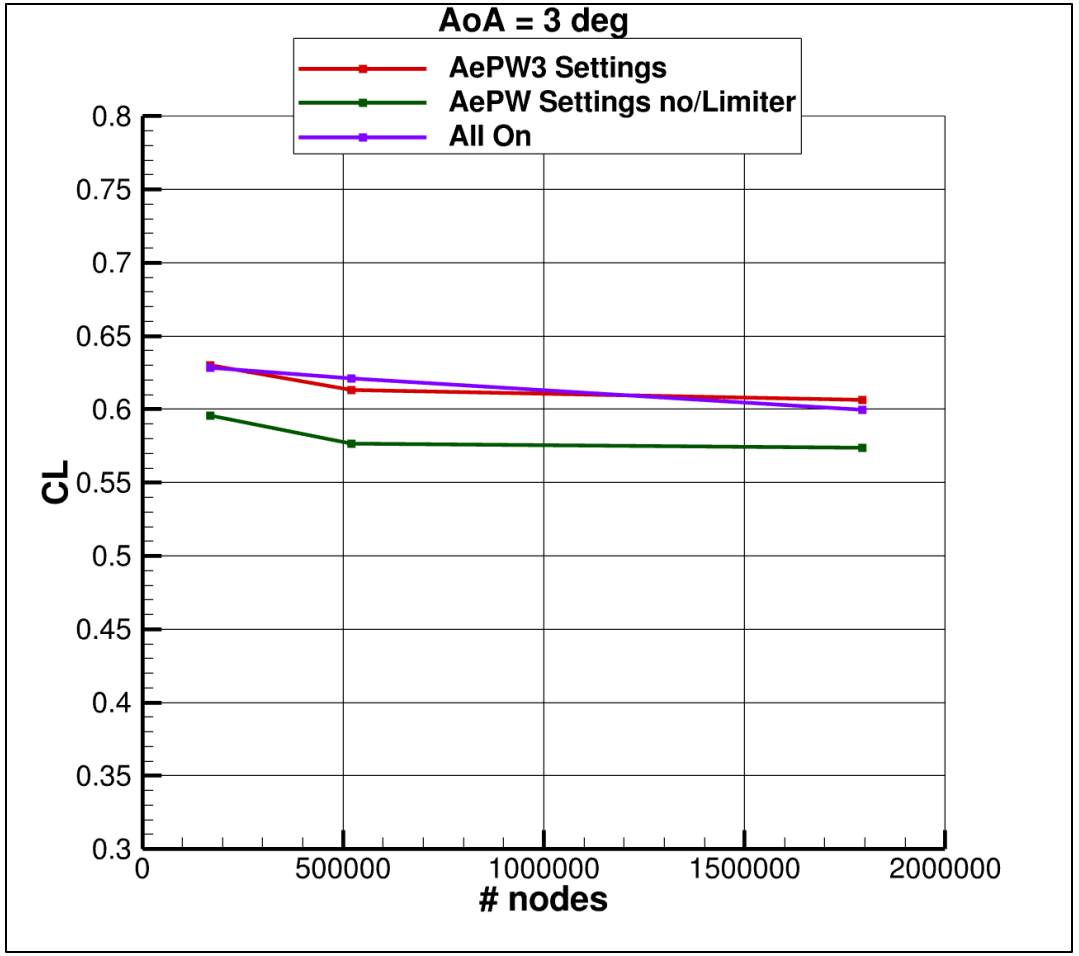


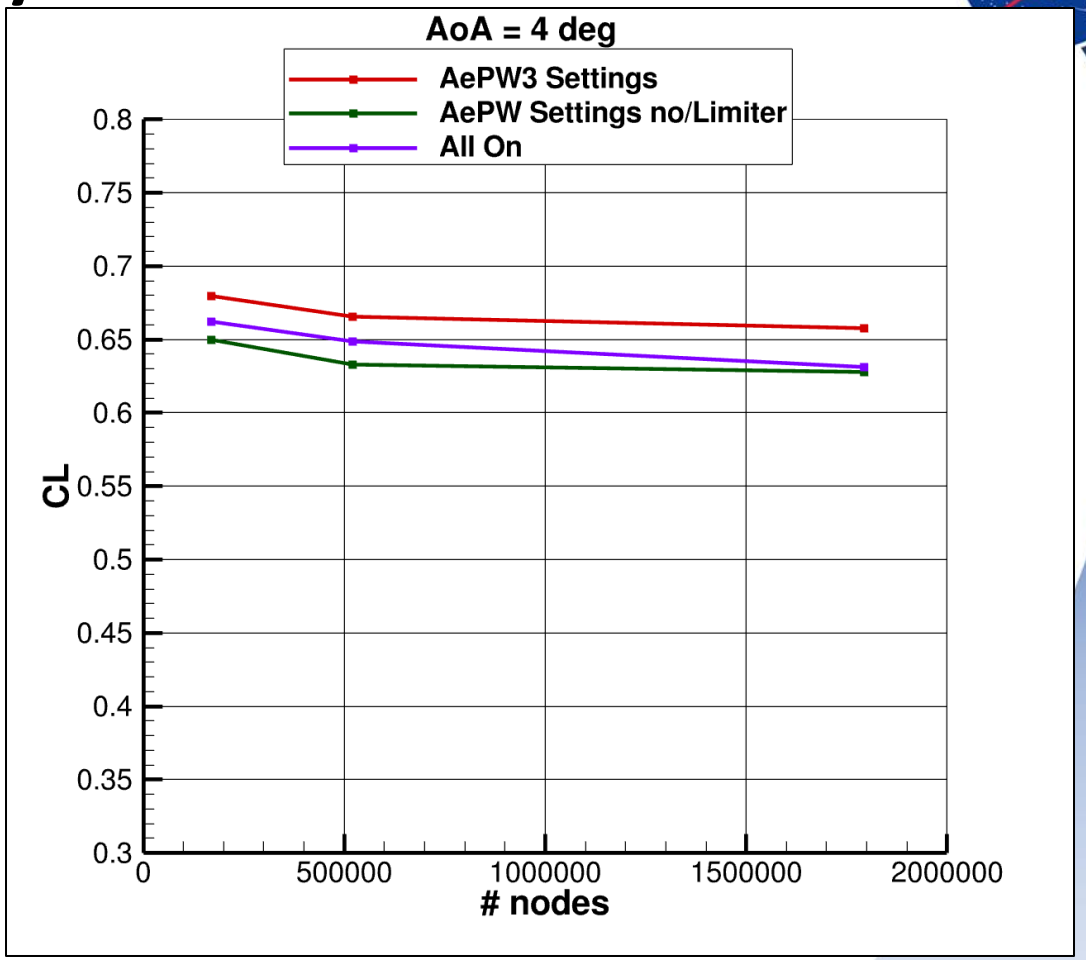


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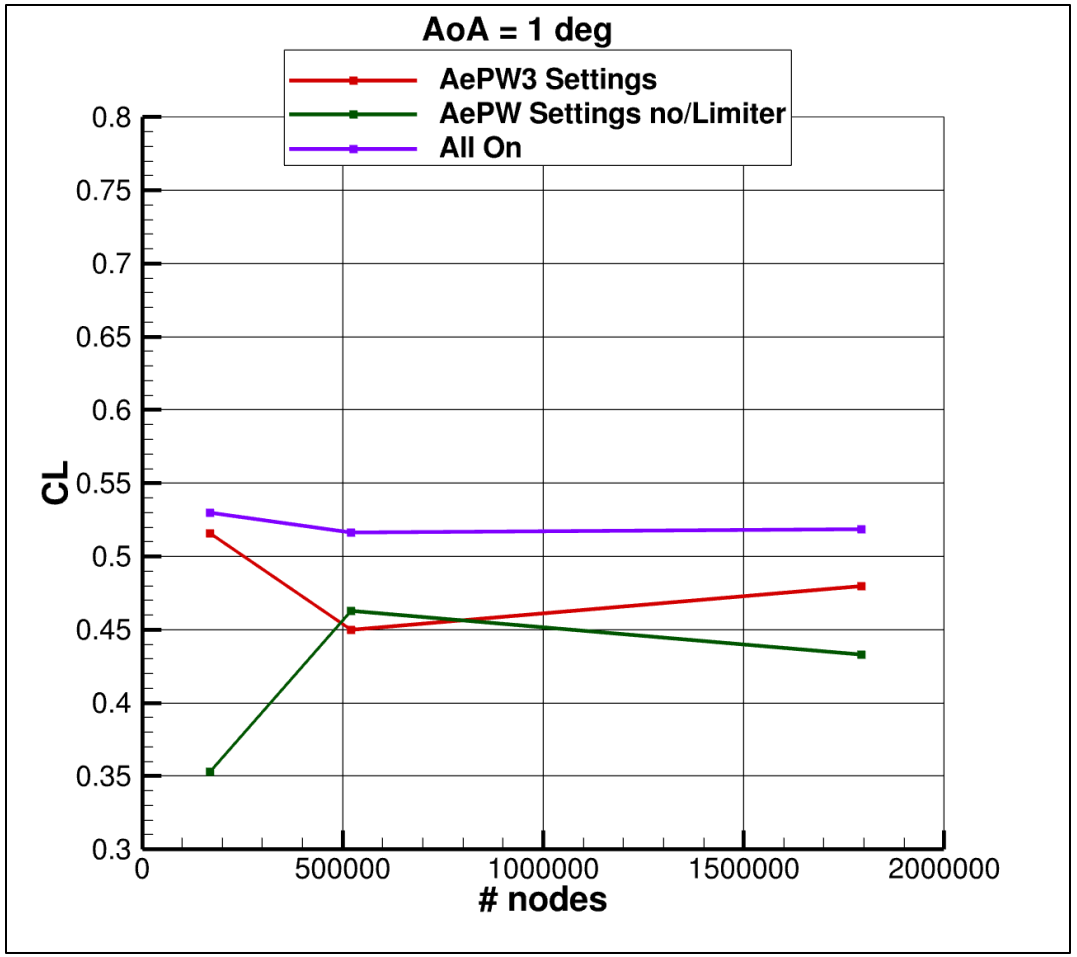
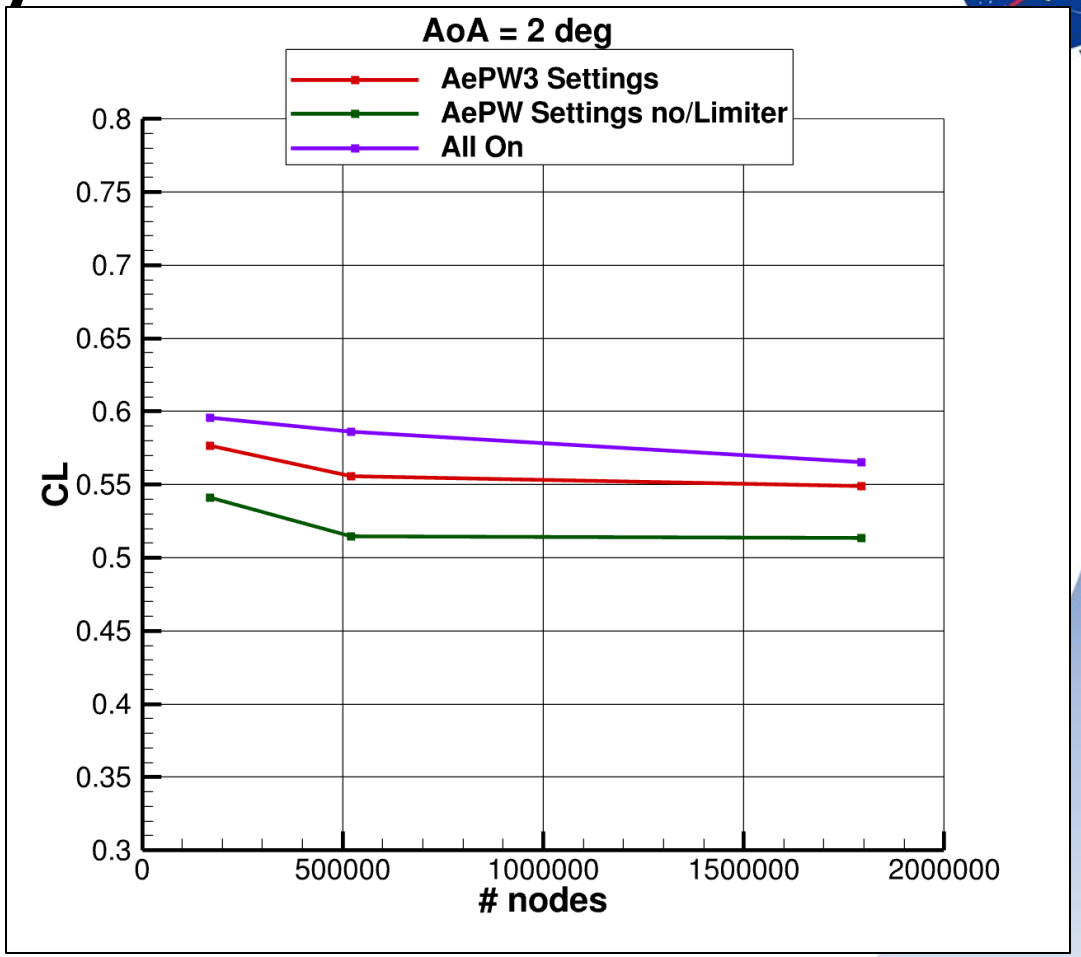
# 2D Analysis

Poor Convergence, AePW-3 Settings !

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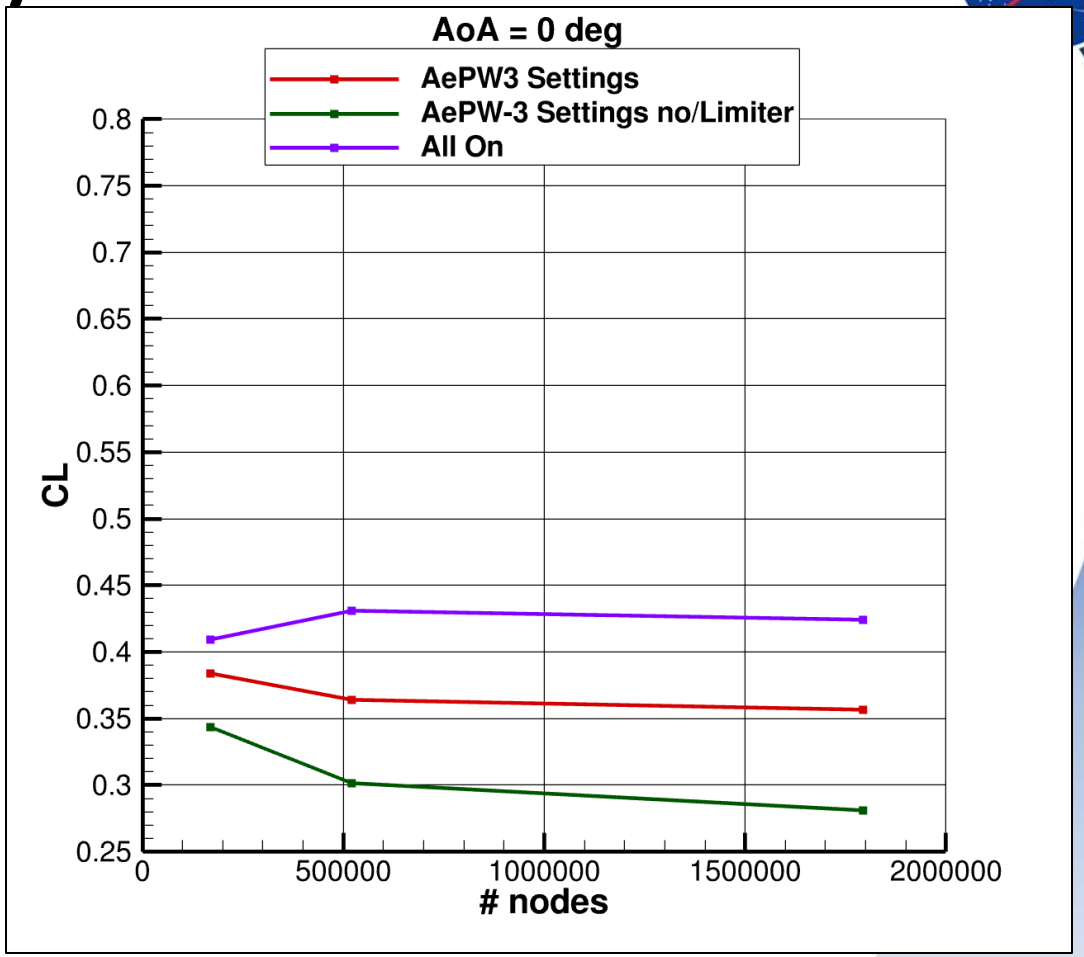


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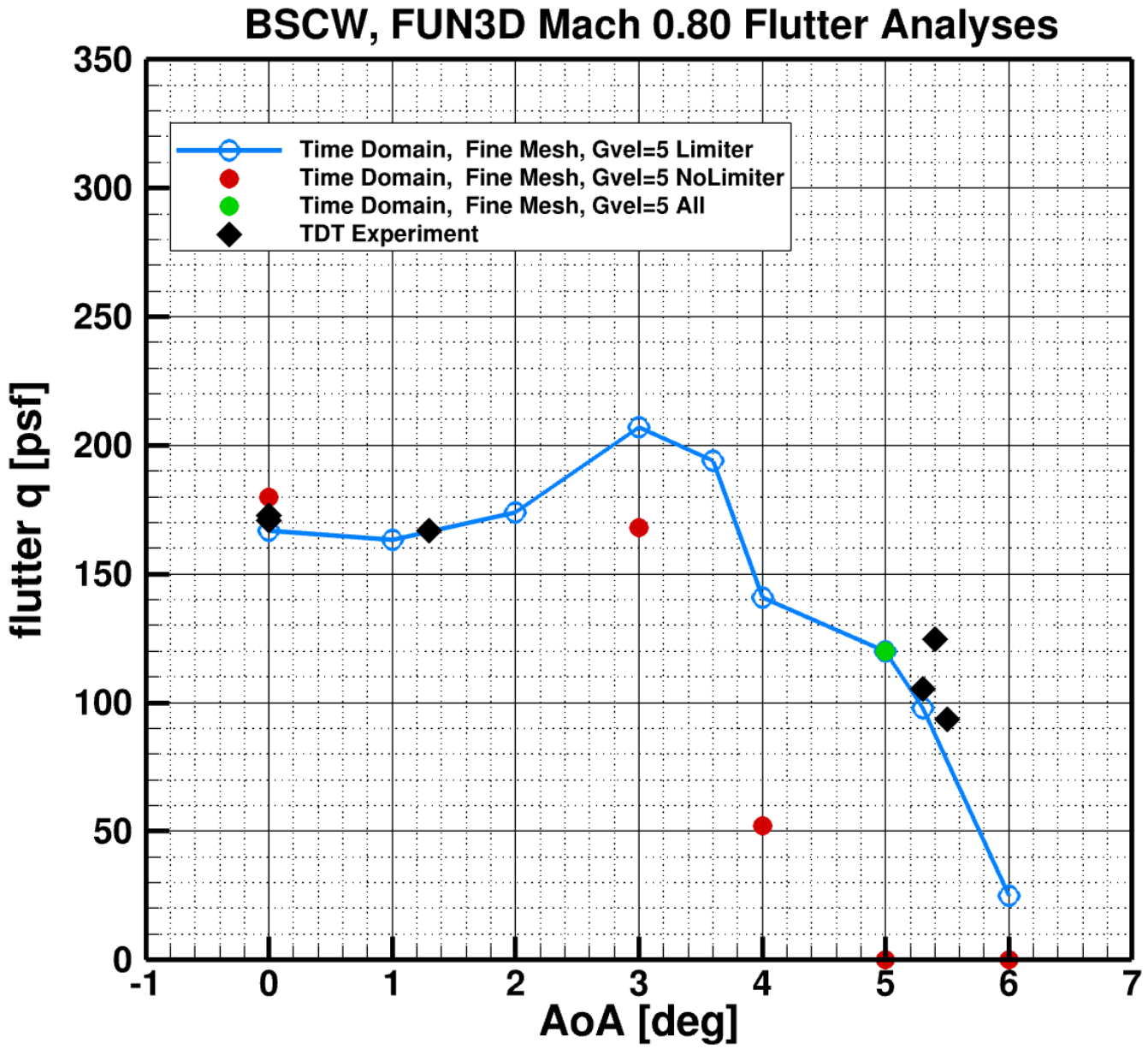
BSCW, FUN3D Mach 0.80 Flutter Analyses
Time Domain, Fine Mesh, Gvel=5 Limiter
Time Domain, Fine Mesh, Gvel=5 NoLimiter
Time Domain, Fine Mesh, Gvel=5 All
TDT Experiment
flutter q [psf]
AoA [deg]
350
300
250
200
150
100
50
0
-1
0
1
2
3
4
5
6
7

- Similarly to ONERA OAT15A, do we need in this working group a 2D BSCW rigid steady analysis across [0, 1, 2, 3, 4, 5, 6] (deg) and three meshes to establish a scatter in data among workshop participants ?
- Considering scatter in rigid steady results do we need to design a 2D BSCW flutter case?