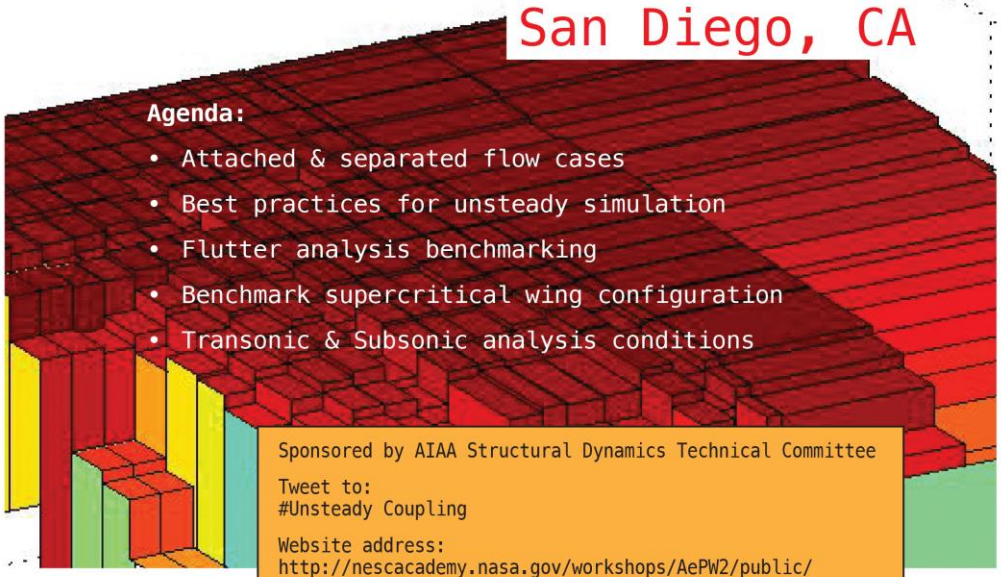
The 2nd AIAA Aeroelastic Prediction Workshop

AePW-2
AIAA SciTech

January 2-3, 2016

San Diego, CA



Agenda:

- Attached & separated flow cases
- Best practices for unsteady simulation
- Flutter analysis benchmarking
- Benchmark supercritical wing configuration
- Transonic & Subsonic analysis conditions

Sponsored by AIAA Structural Dynamics Technical Committee

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#Unsteady Coupling

Website address:
http://nescacademy.nasa.gov/workshops/AePW2/public/

AePW-2 Day 1 Recap

Welcome, overview, logistics and agenda
Jennifer Heeg – NASA

- Welcome, overview, logistics and agenda (Jennifer Heeg – NASA)
- Present the final list of participants
- Logistics
- Review the objectives of AePW – Learn with our mistakes
- News in AePW-2 – never do more than one config! Flutter cases.
- Why BSCW – It's challenging enough, cases descriptions
- FRF results, phase matters.
- February 29th last day to commit AePW-2 results

AePW-2 Day 1 Recap

Fluid-Structure coupling methods
Mats Dalenbring - FOI

- Review of Monolithic vs staggered approach
- CFD and FEM have different numerical and temporal requirements
- Mesh deformation vs mesh translation or rotation
- Compares different time-steps and flutter predicted dynamic pressures
- Interesting results about, RANS and hybrid RANS-LES modeling in show motion cases

AePW-2 Day 1 Recap

Turbulence Modeling effects
Yuval Levy – Israeli CFD Center

- Good overview about turbulence model classification:
  - Boussinesq hypothesis
  - Reynolds stress-models
  - Hybrid RANS-LES
- Most of participants are using Boussinesq (SA and k-w SST)
- For attached flows, standard RANS models are OK.
- For really unsteady and detached flows, turbulence modeling really matters.
- Show different models, results, boundary conditions for BSCW detached flow cases

AePW-2 Day 1 Recap

Temporal effects summary
Jennifer Heeg – NASA

- Discuss about unsteadiness identified with RANS and URANS
- How to determine the wright time-step
- How to decoupled time and mesh dependence
- Sub iteration effects
- 10 cycles at least is a rule of thumb
- Time step really matters, can effective changes the results.

AePW-2 Day 1 Recap

Linear Methods
Guilherme Begnini - Embraer

- Show a variety of linear methods based on AiC (NASTRAN and ZTRAN), adjusted and non-adjusted
- NASTRAN with Generalized Aerodynamic Forces from Linearized CFD
- Linearized time domain CFD results
- Non linear Euler time domain CFD results
- DLM presented the closest results in terms of flutter velocity and frequency.