NuMAD
Blade Structural Analysis

Daniel Laird

Wind Energy Technology Department

Sandia National Laboratories

Telephone: (505) 844-6188

E-mail: dllaird@sandia.gov

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy under contract DE-AC04-94AL85000.

NREL

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Motivation

- Assist utilization of FEA in addition to spreadsheet-based beam models

- Significantly decrease model generation time for 3-D, FE models of wind turbine blades

What is NuMAD?

GUI pre-processor and post-processor for ANSYS® finite element analysis software

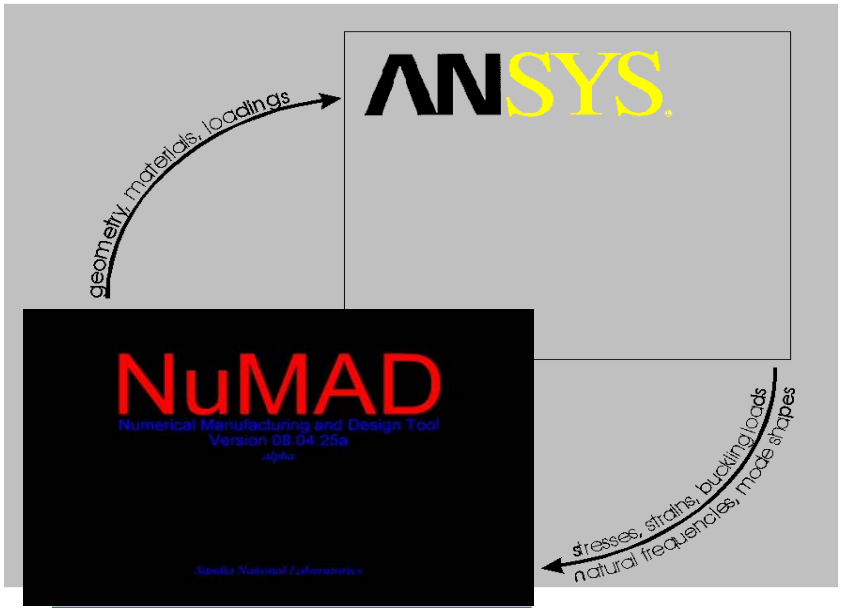
Tailored to design and analyze wind turbine blade structures

Enables users to quickly and easily create a three-dimensional model and perform structural analyses

General FEA background needed for proper use

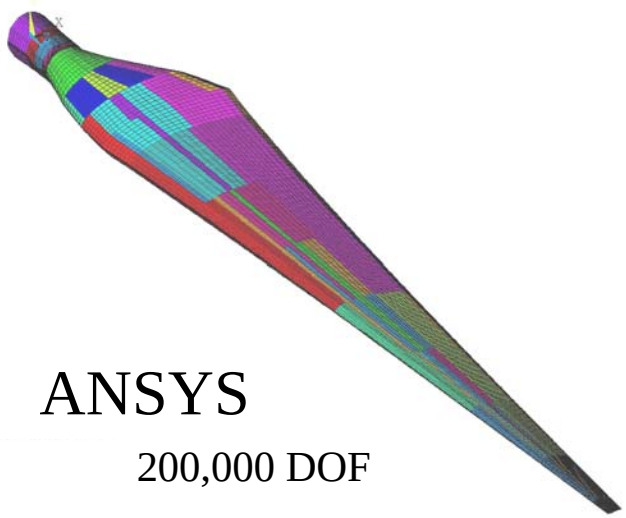
Flexibility/expandability

- materials database
- airfoils database



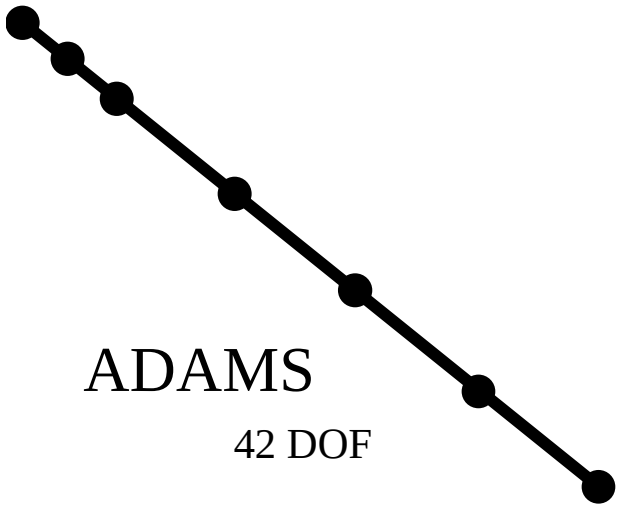
Beam Property Extraction

- Joint effort between GEC and SNL
- Automatically produce 1-D beam element properties needed for an aeroelastic simulation (FAST/ADAMS) from the 3-D structural finite element model (NuMAD/ANSYS)



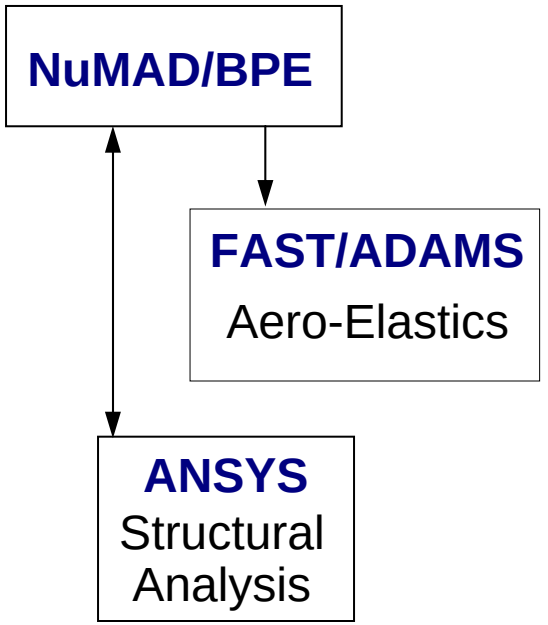
ANSYS

200,000 DOF

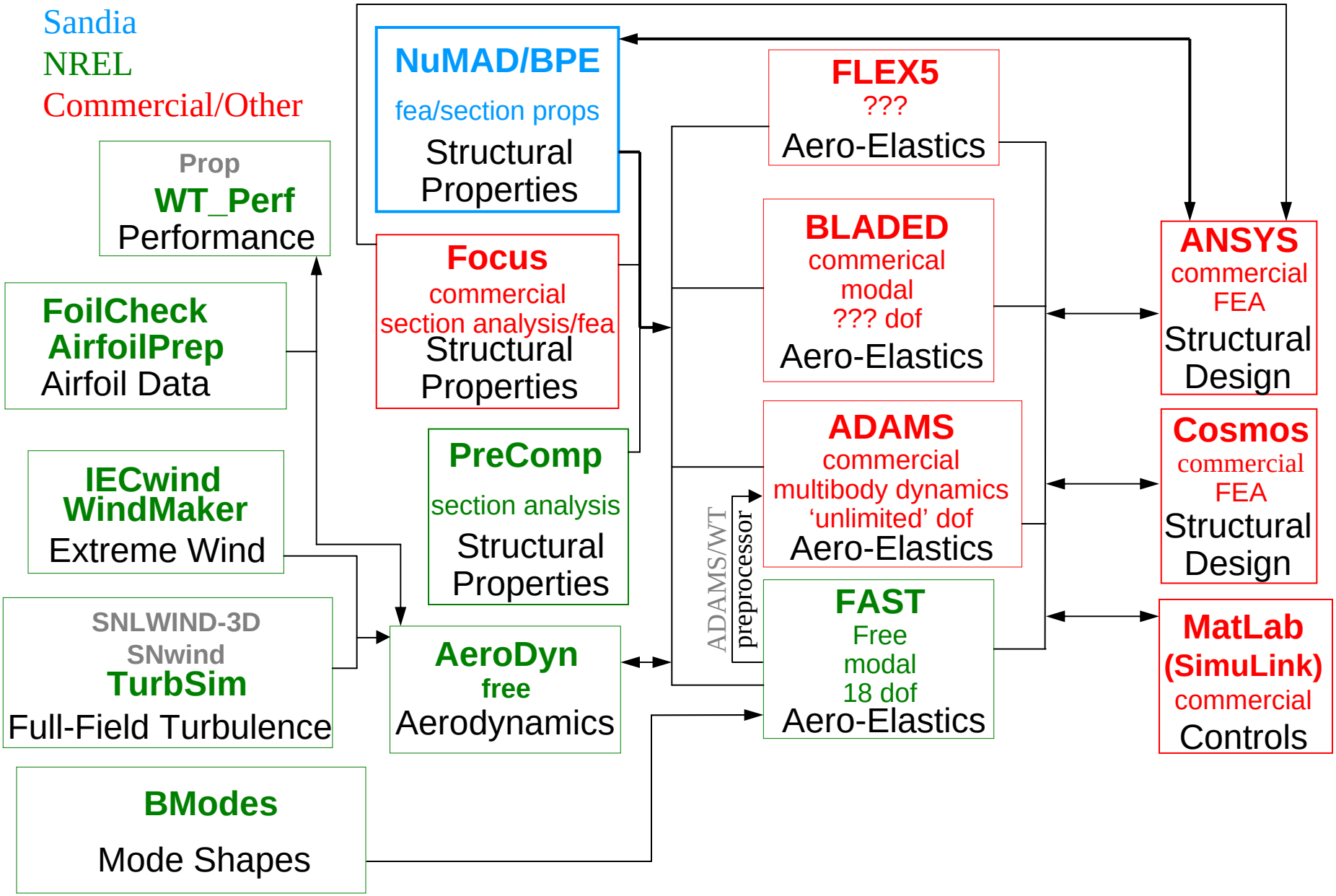


ADAMS

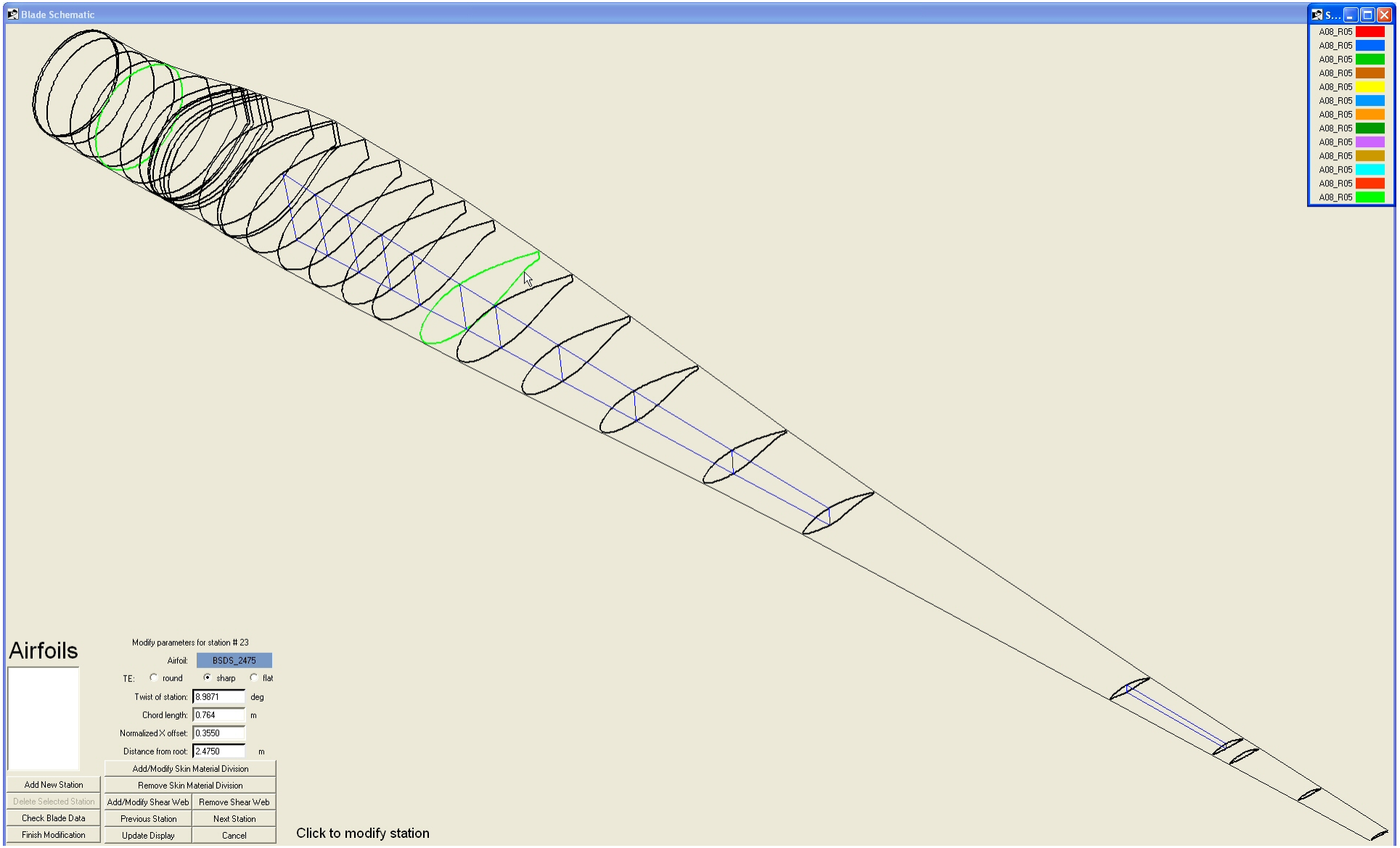
42 DOF



Design Codes (U.S. usage)

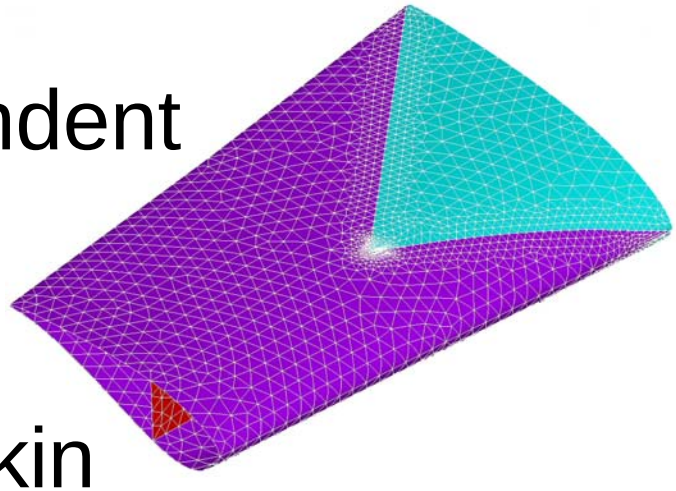


Interface (NuMAD2008)



New Capabilities

NuMAD2008



- Airfoil specification-independent
  - skin material definition
  - shear web placement
- Triangular areas in blade skin
- Free meshing / Meshing control
- Flatback capability
- Multiple element formulations

Obtain Code?

contact me

Thank You