Delft Pazy Wing: Parametric Flutter Margin method

Stefan de Boer

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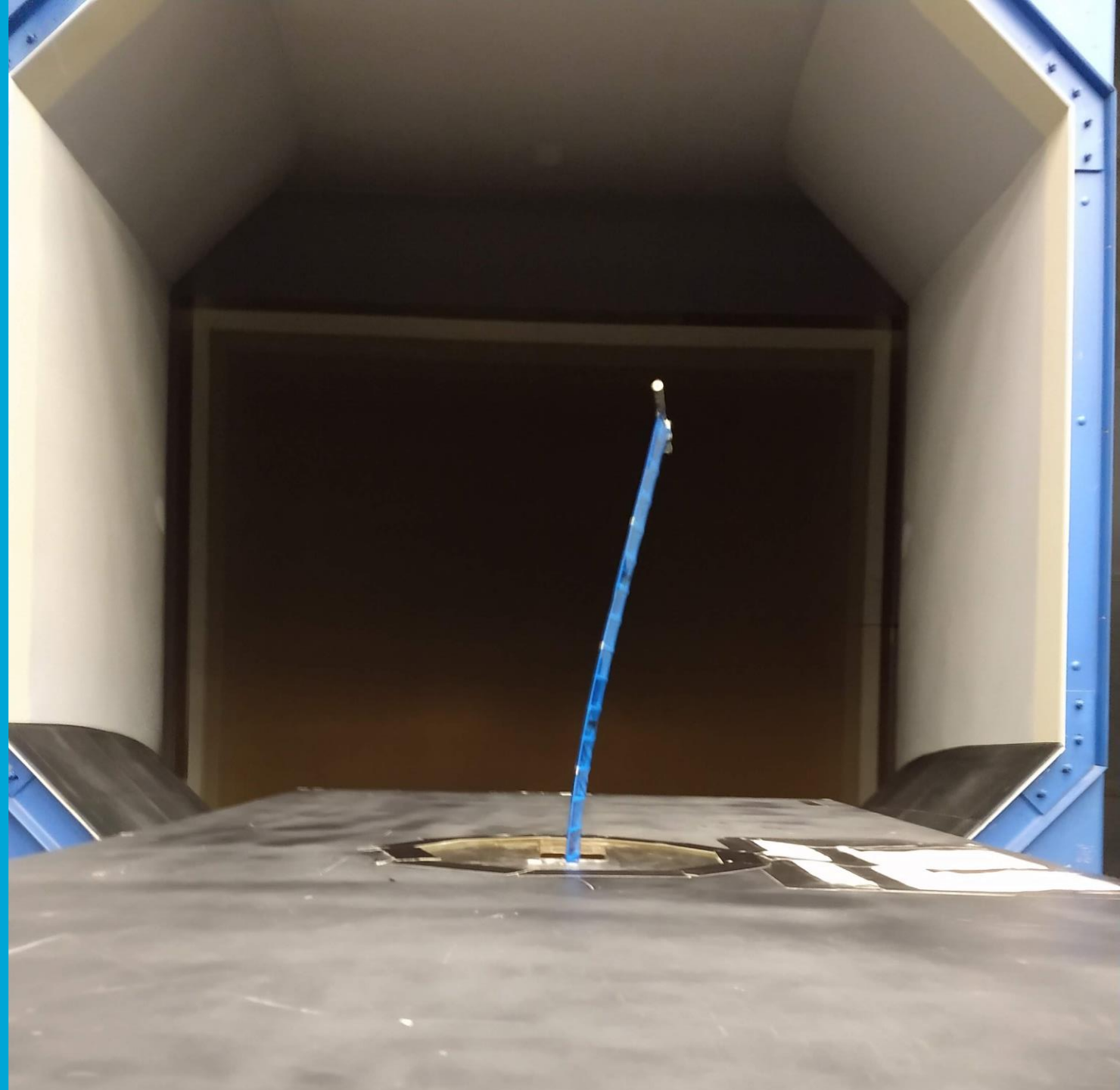
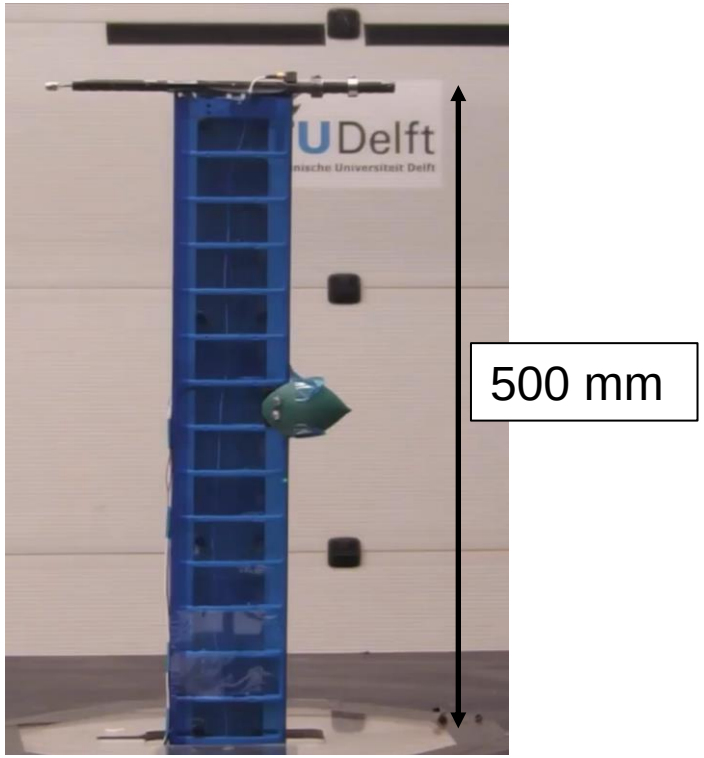


Delft Pazy Wing – Dimension



Span	550 mm
Chord	100 mm
Tip Rod	272 x 10 mm
Spar	550 x 60 x 1.5 mm
Spar material	aluminium 7075
Structure material	Nylon 12
Skin material	Oracover Oralight
Aerofoil	NACA0018
Wing mass	260 g

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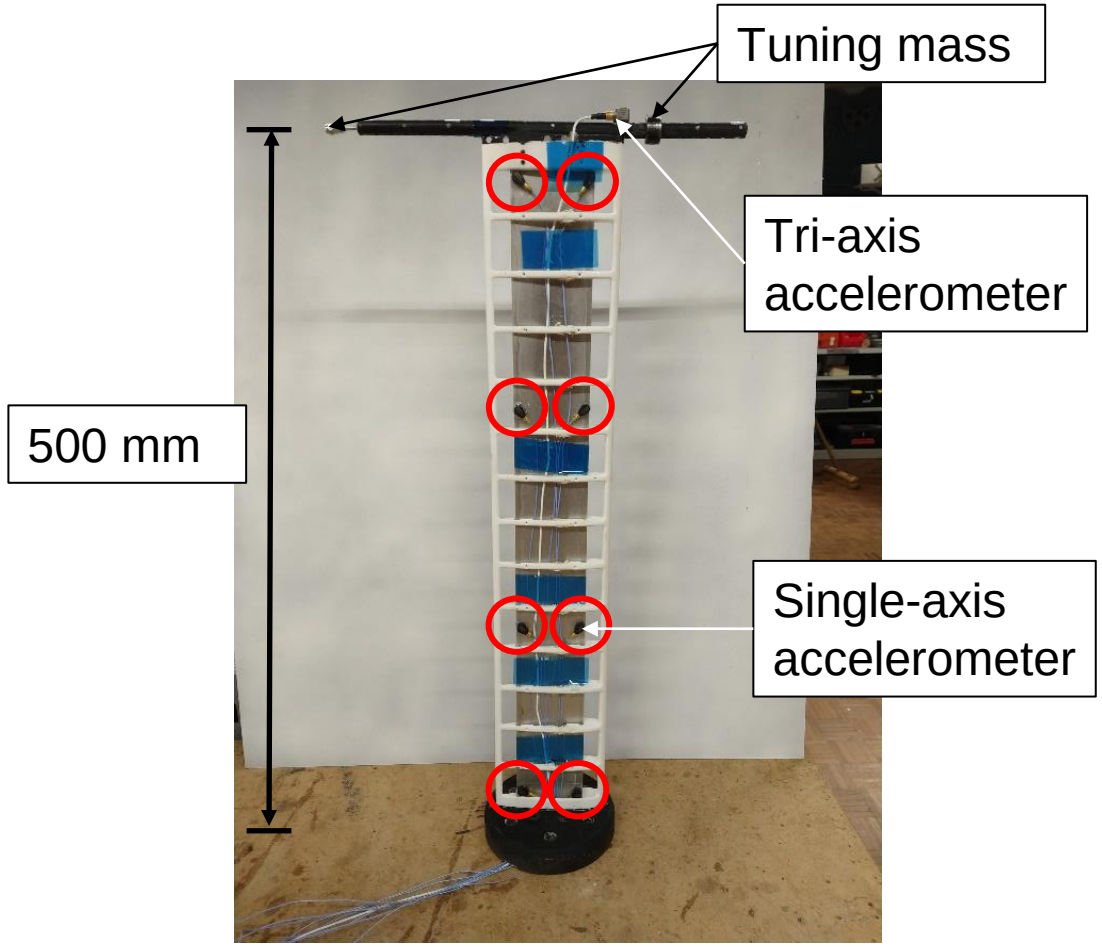
Delft Pazy Wing – Sensors and tuning masses

- Present throughout all experiments
- 8 single axis accelerometers (circled in red)
- 1 Tri-axis accelerometer on tip-rod at LE
- Tuning masses: At rear of tip rod and in front of LE on tip rod → Destabilise wing to allow flutter in OJF TU Delft



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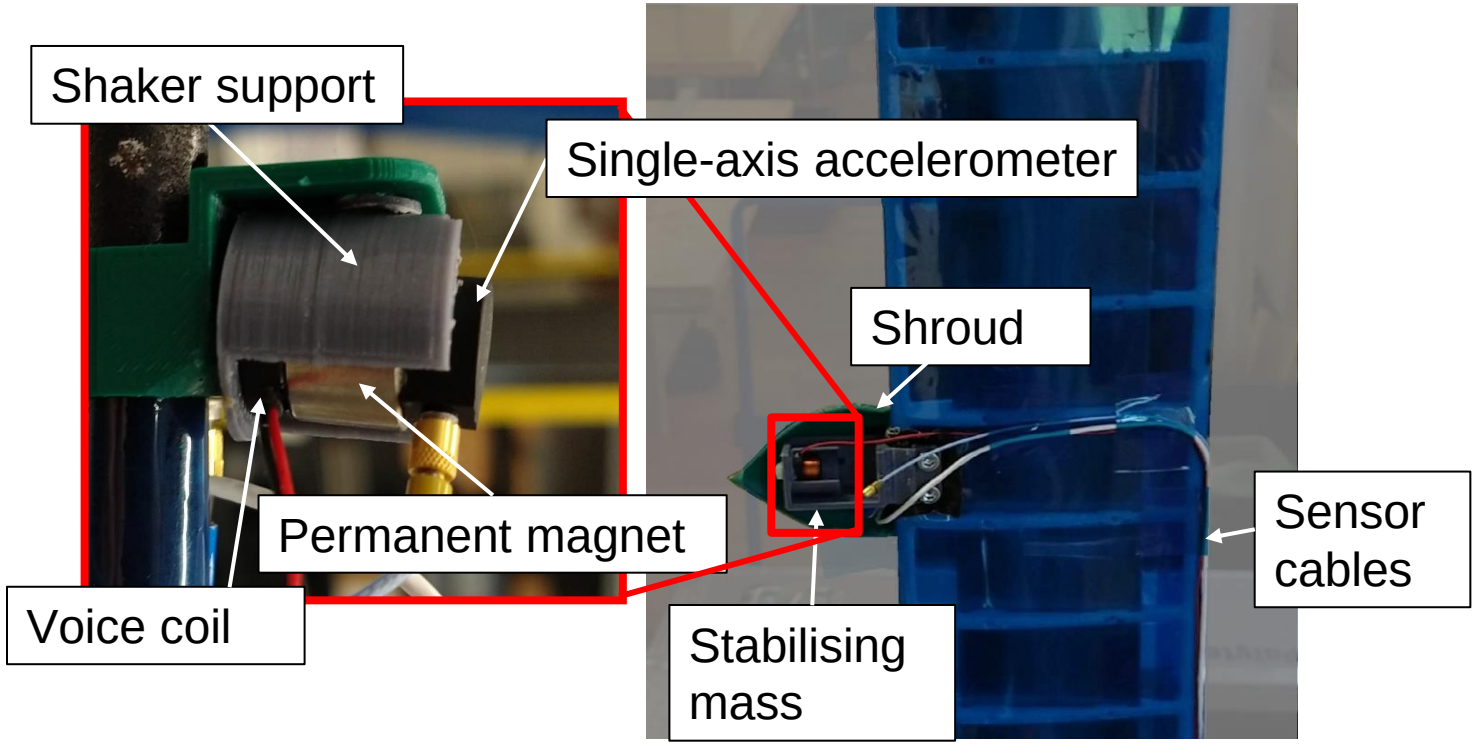
Delft Pazy Wing – Sensors and tuning masses

- Specific to Parametric Flutter Margin (PFM) experiment
- 1 Shaker (voice coil and permanent magnet)
- Single axis accelerometer on shaker to measure shaker input
- Three-axis accelerometer: part of stabilising mass, used to measure system response



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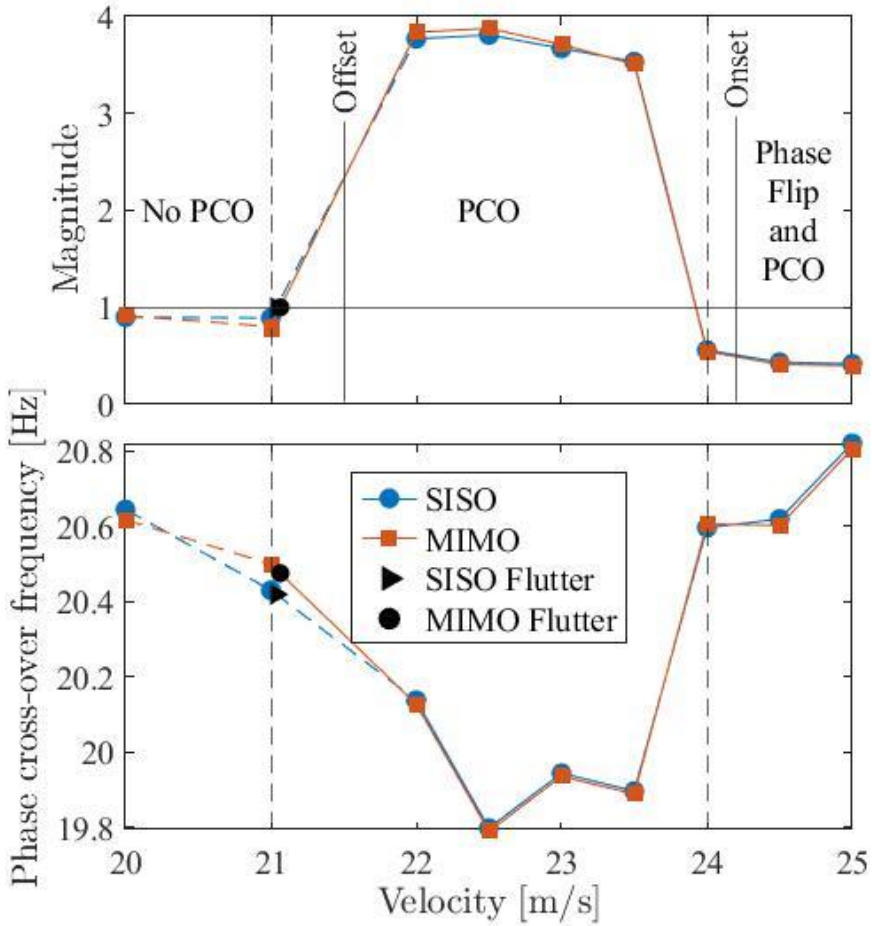
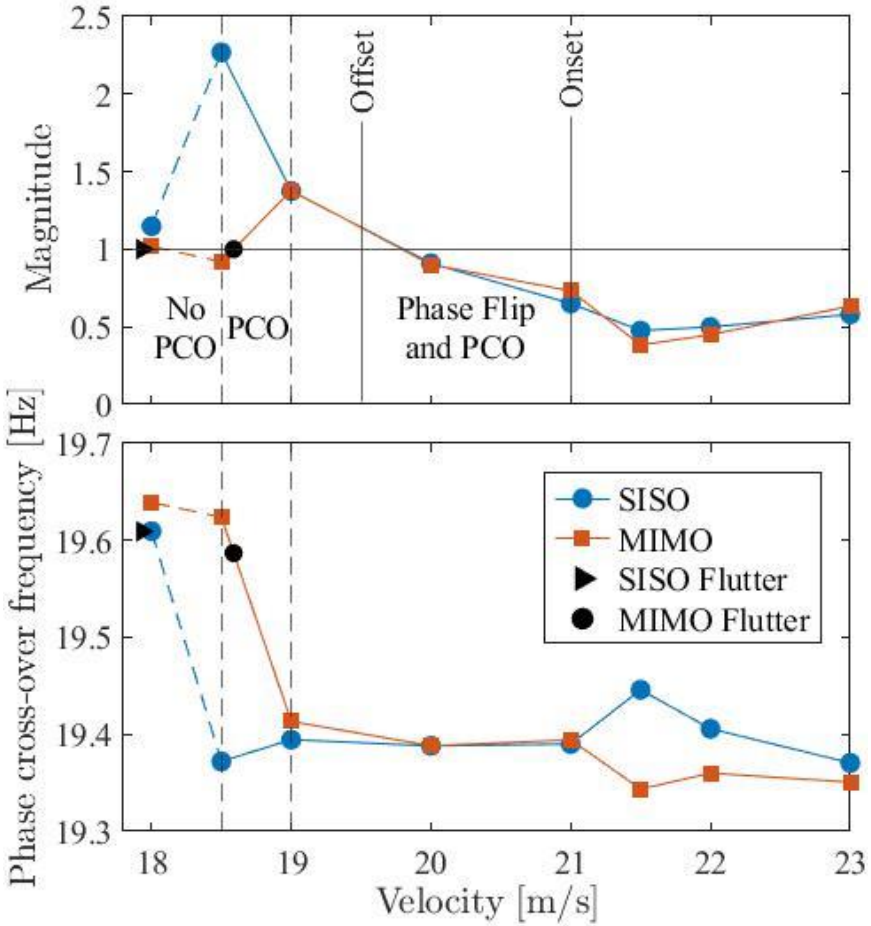
PFM and flutter experiment results



AoA = 0˚



AoA = 4˚

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Available Data

- Paper corresponding to experiment: https://doi.org/10.2514/6.2023-0379
- PFM measurement data: https://doi.org/10.4121/21656672
  - FRF of the PFM measurements used to determine flutter boundary
- GVT of all different configurations (without PFM equipment, and with PFM equipment) (on request)
- Full list of used masses and configurations (on request)
- Accelerometer data of transition into LCO and LCO (on request)
- NASTRAN model (on request)
- Python code to determine large nonlinear deflected shape (on request, requires clean-up of code)

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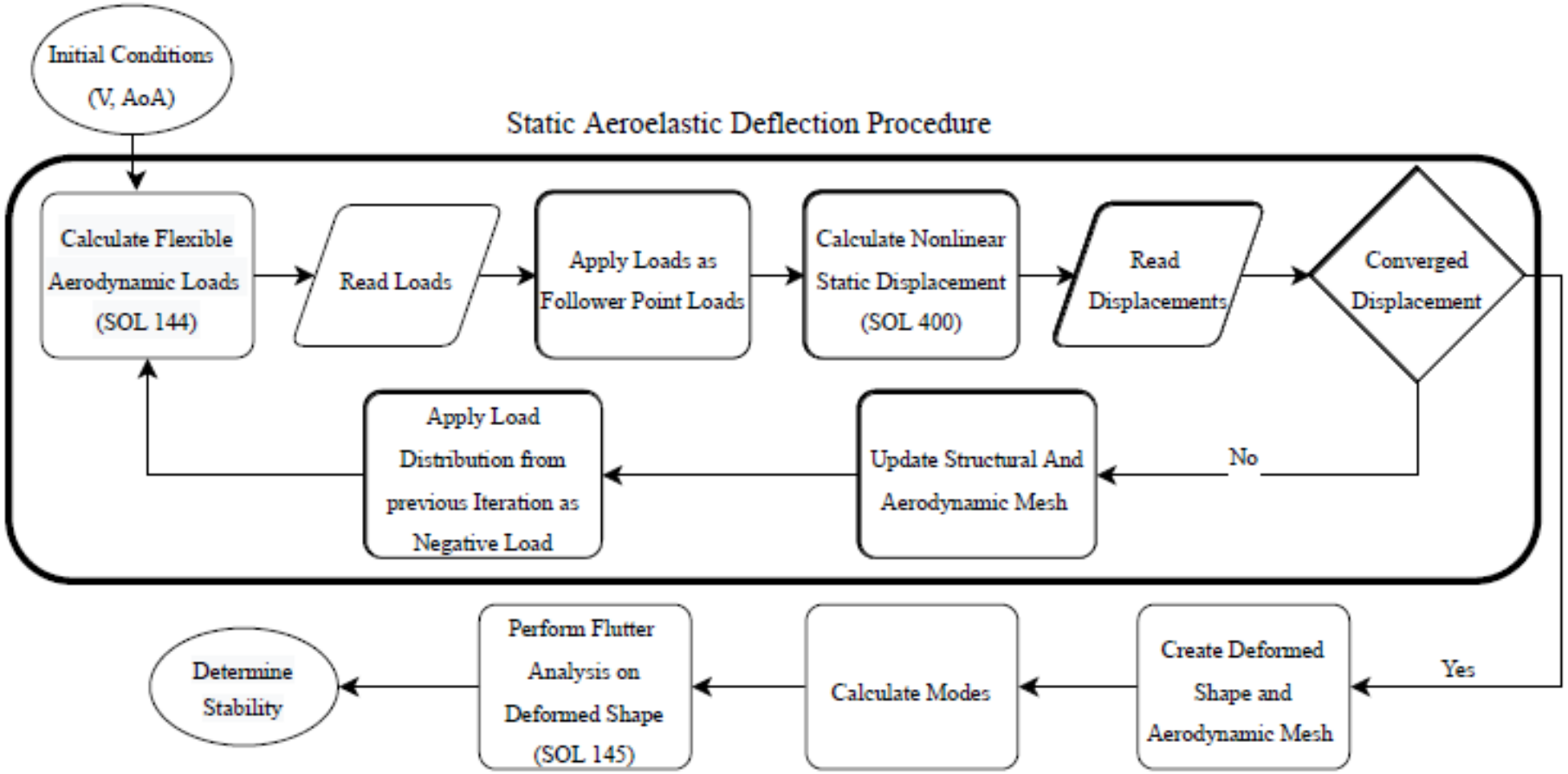
Nastran nonlinear deflections



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