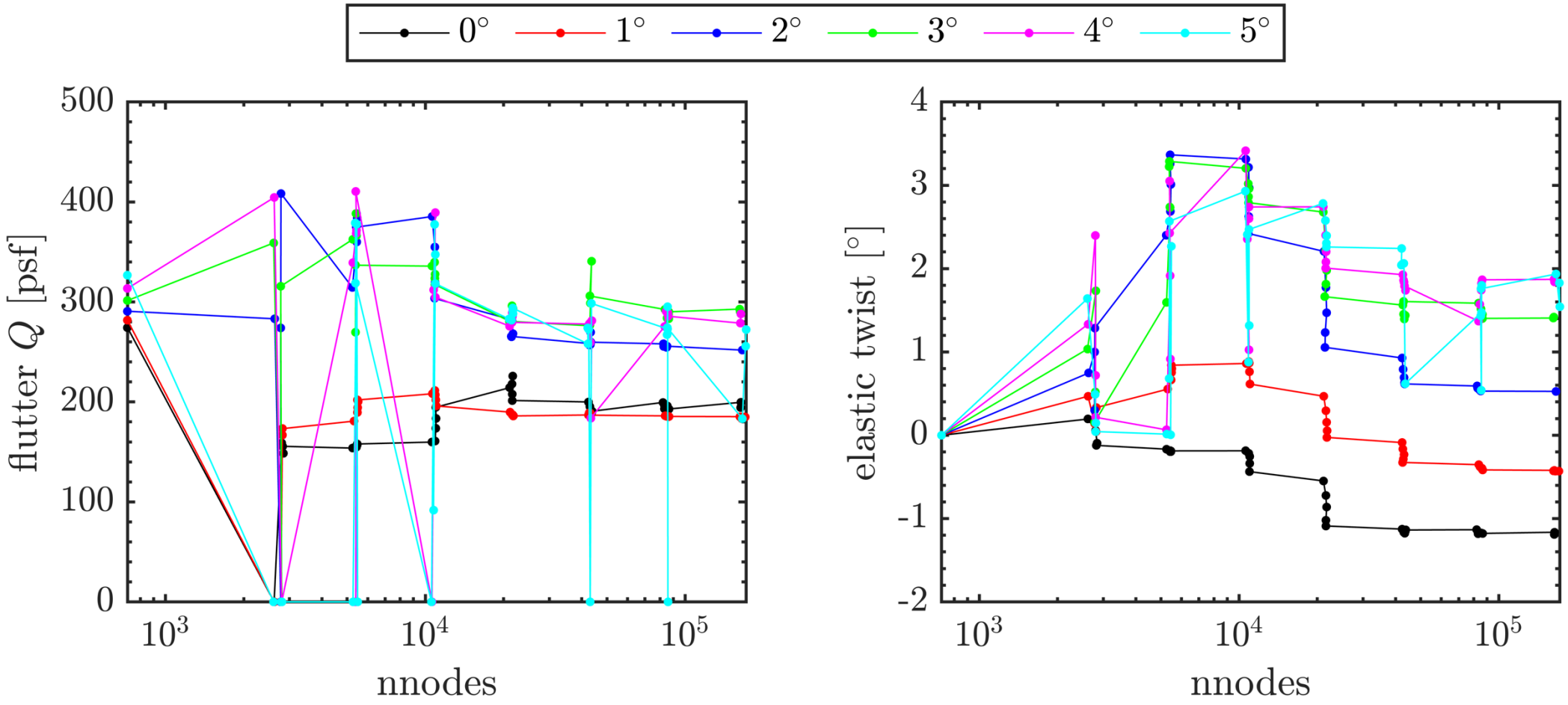
2D BSCW Flutter Solutions with Refine

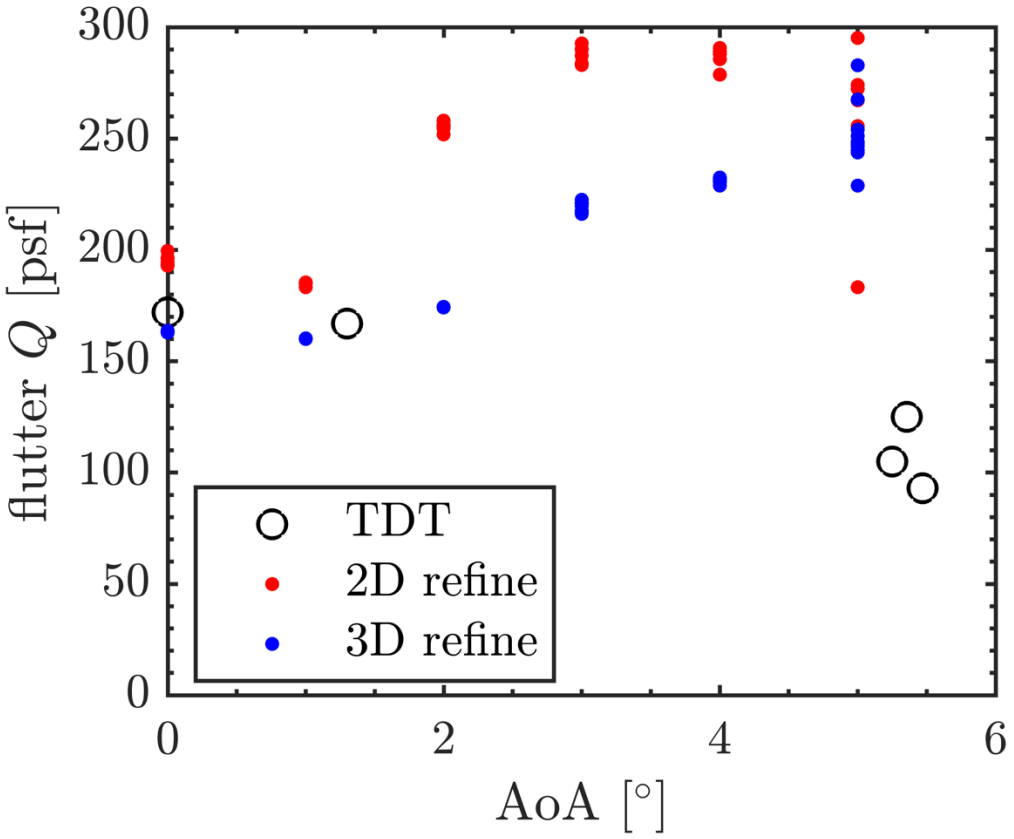
- Multiscale mesh refinement with *refine*
  - https://github.com/nasa/refine
- *pyrefine* is a python wrapper of *refine*, and allows us to integrate LFD-based flutter solutions into the mesh refinement process
  - https://github.com/nasa/pyrefine

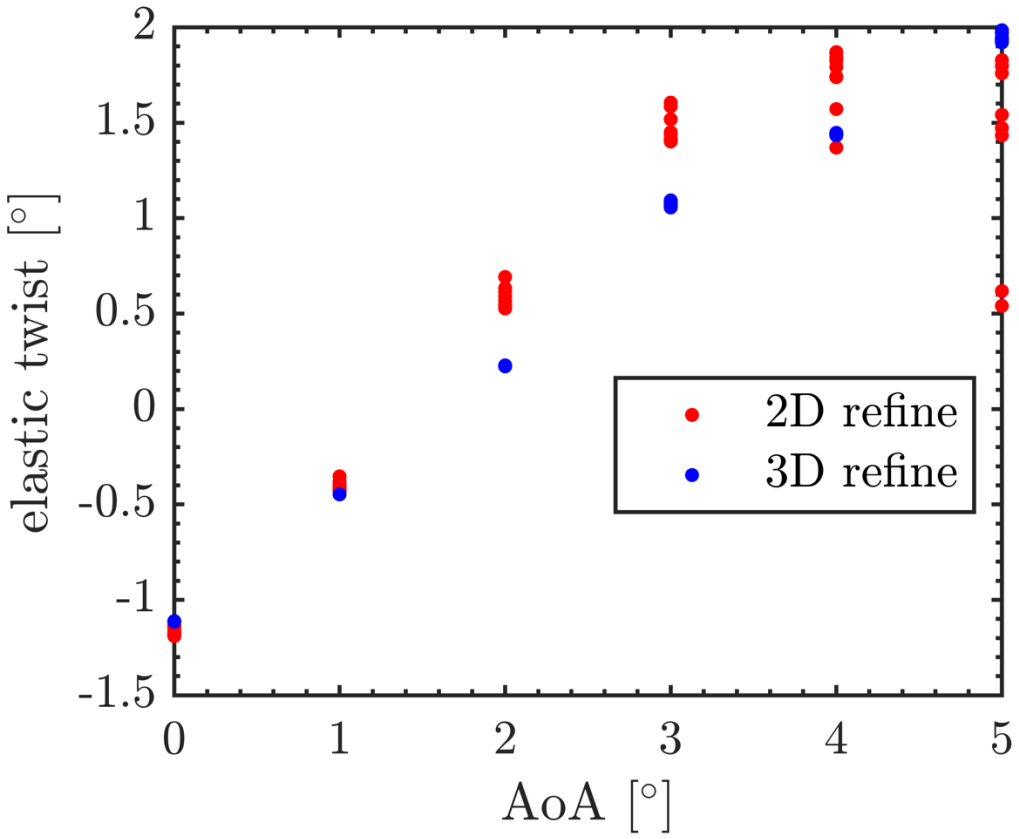
1. Compute the steady flow over the wing with FUN3D/SFE
2. Use the LFD solver to linearize about the steady flow, and compute the flutter-q
3. *refine* generates a new mesh using the multiscale metric scalar field (Mach number) of the steady flow
4. Based on the flutter-q, and the pitching moment of the steady flow, the AoA is updated so that the airfoil is in pitch-equilibrium
5. Repeat with the new mesh, and the new AoA

Results


0°
1°
2°
3°
4°
5°
flutter Q [psf]
500
400
300
200
100
0
10^3
10^4
10^5
nnodes
elastic twist [°]
4
3
2
1
0
-1
-2
10^3
10^4
10^5
nnodes

Results


flutter Q [psf]
AoA [°]
TDT
2D refine
3D refine


elastic twist [°]
AoA [°]
2D refine
3D refine

Mach Contours