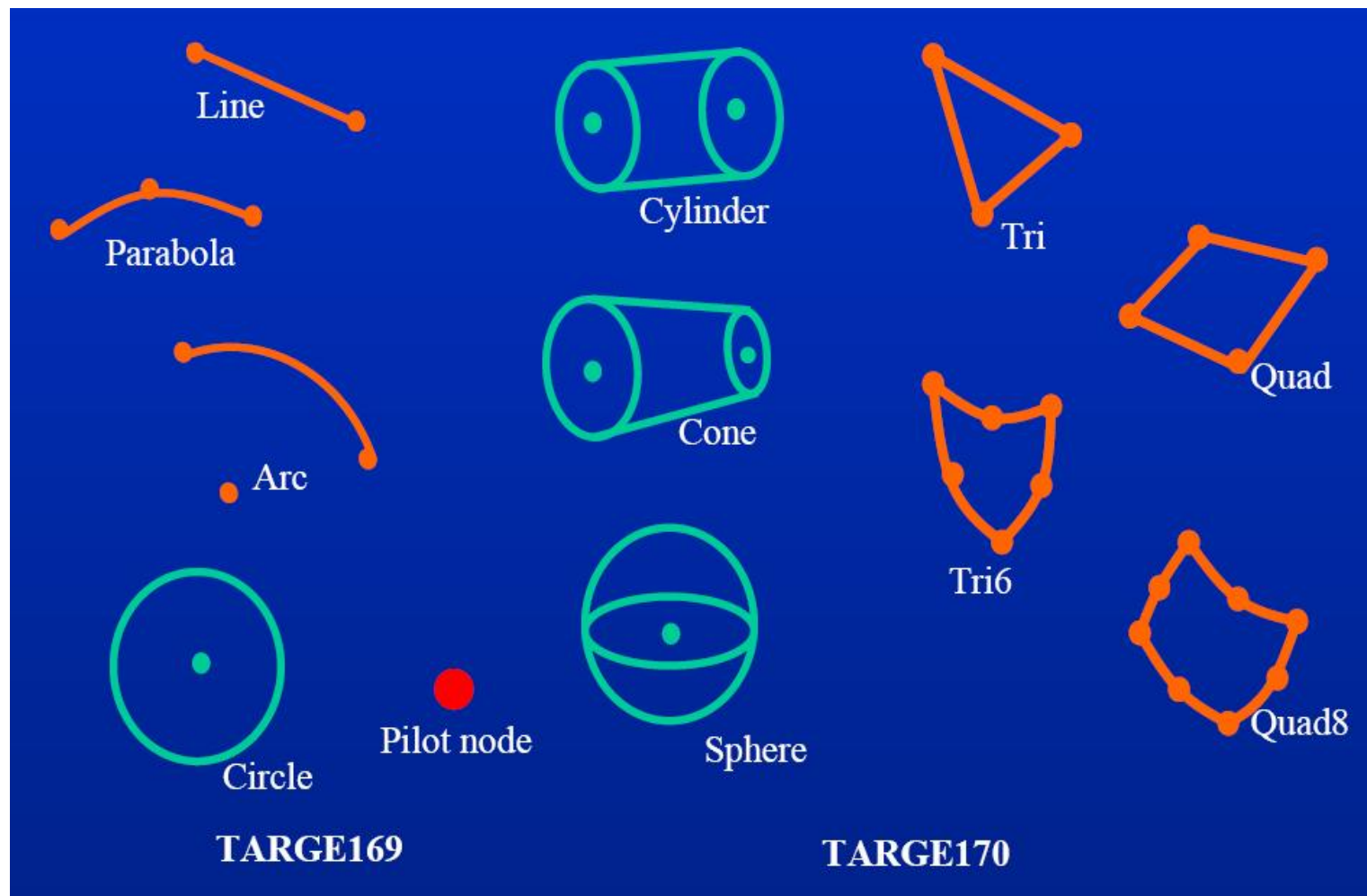
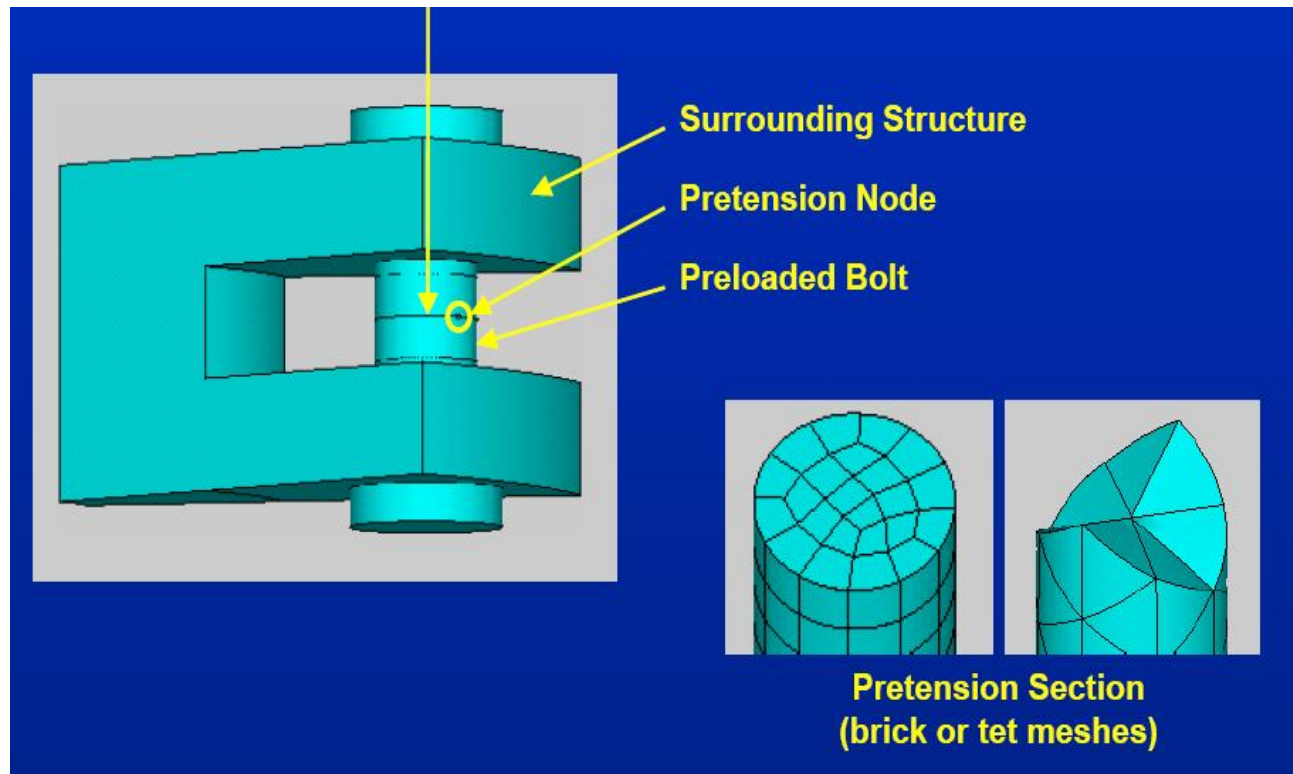


Target Segment



Bolt Pretension Element

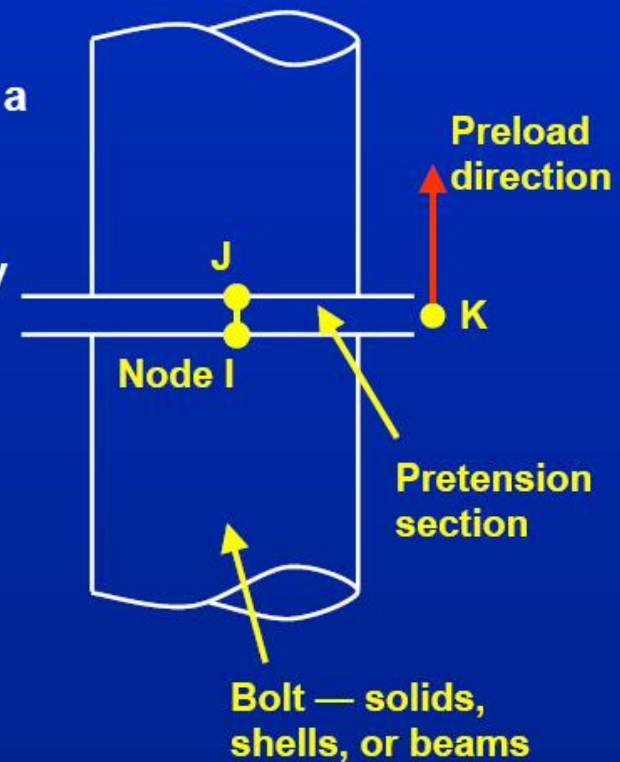
Pretension Element (Prets179)



Pretension Element--Prets179

Features of the Pretension Element

- A set of pretension elements is identified as a “section”.
- 2-D or 3-D line element that acts like a “hook” connecting two halves of a bolt.
- Nodes I, J are the end nodes, usually coincident.
- Node K is the *pretension node*:
 - Location is arbitrary.
 - Has one DOF: UX.
 - Used to define the preload, as an FX force or UX displacement.
 - Actual line of action is in pretension load direction





Pretension Element--Prets179 (Continued)

- **Preload direction is constant – it does not update for rotations. It can be re-defined during load steps.**
- **No material properties or key options**
- **Underlying bolt elements may be solids, shells, or beams, lower or higher order.**
- **The DOF: translations, rotations, temperature, voltage which are detected internally based the DOF of underlying elements.**
- **Elements created automatically using GUI-based procedure.**

FEM Analysis

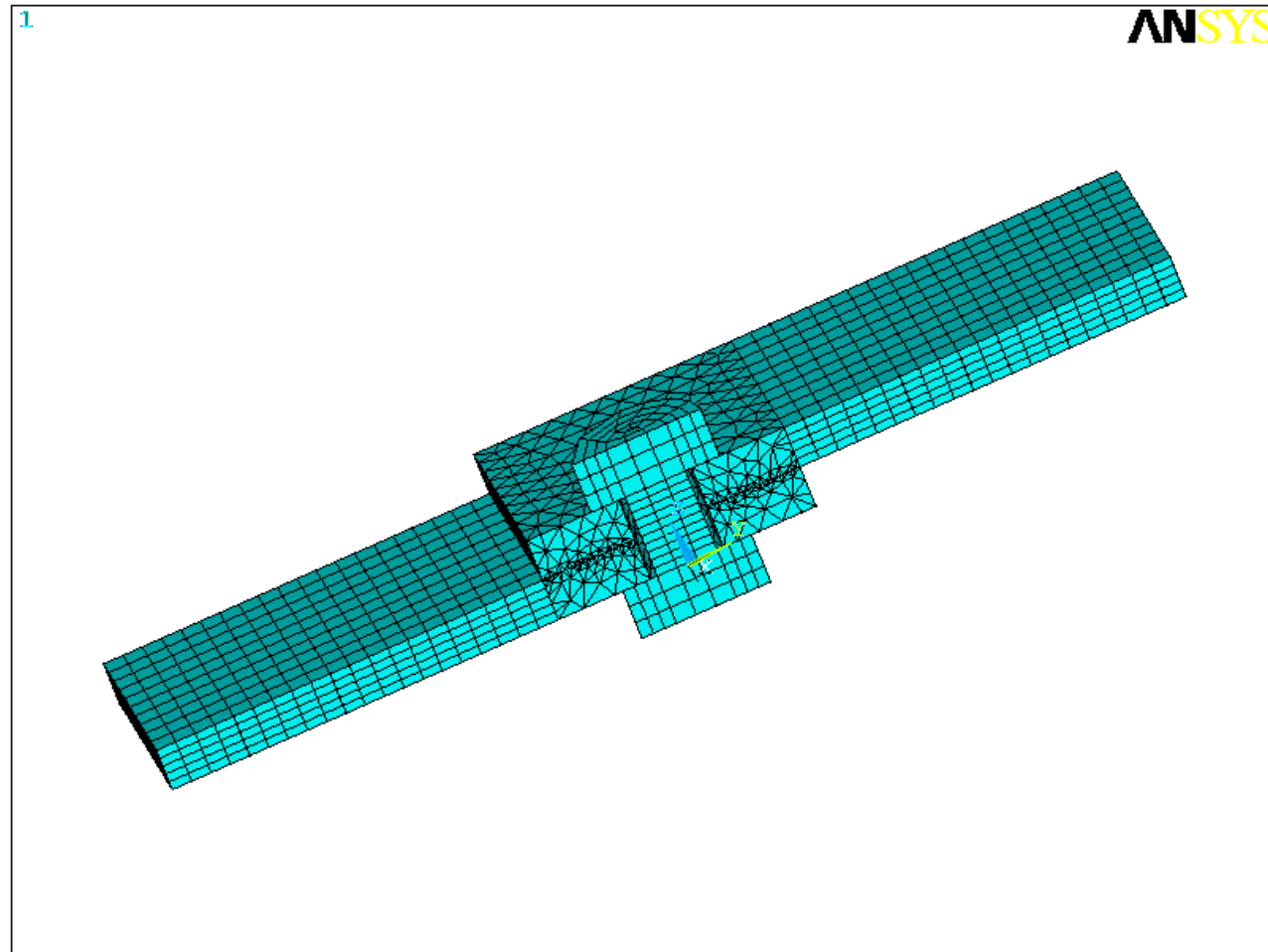
Model, Solution, Results



Model Idealization

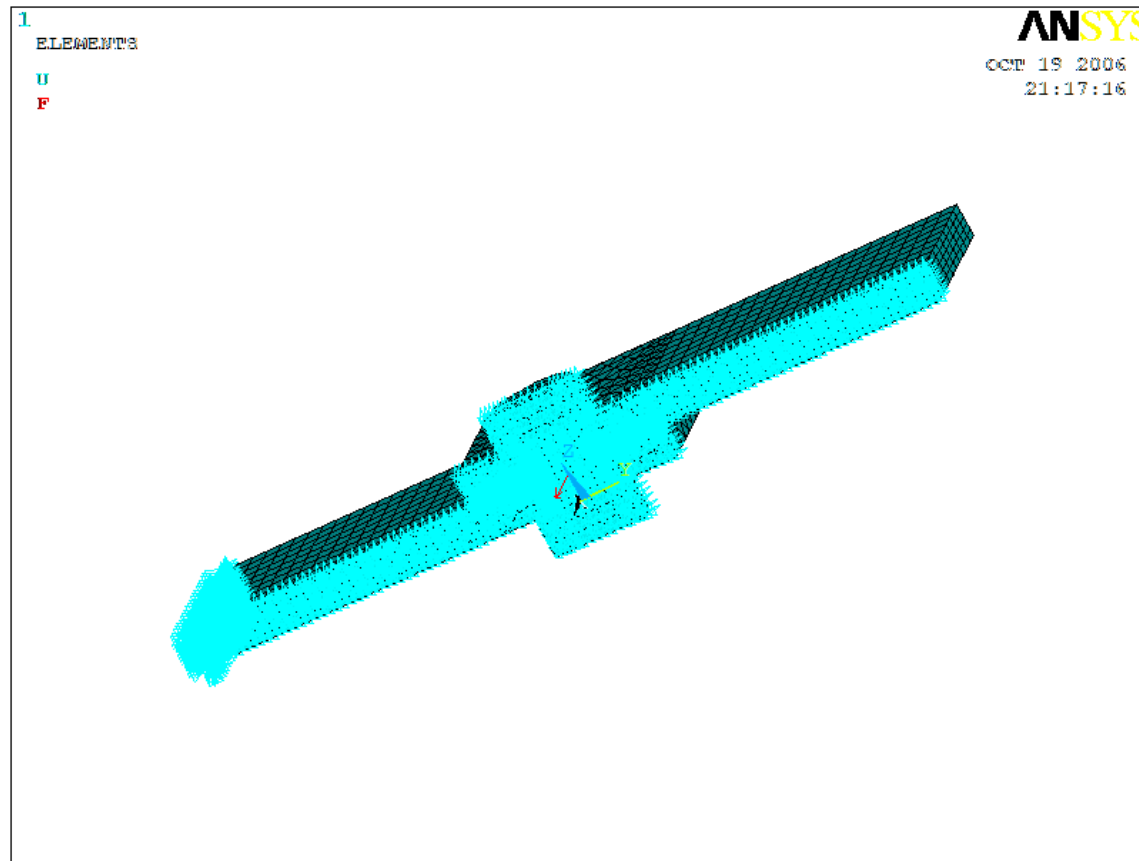
- n No eccentricity loads applied on bolt
- n Simplify threaded contact between bolt and nut into glued entities
- n Simplify Nut hexagonal outshape into circular
- n No fillets or chamfers with bolt and nut.

Model-joints (without washer)

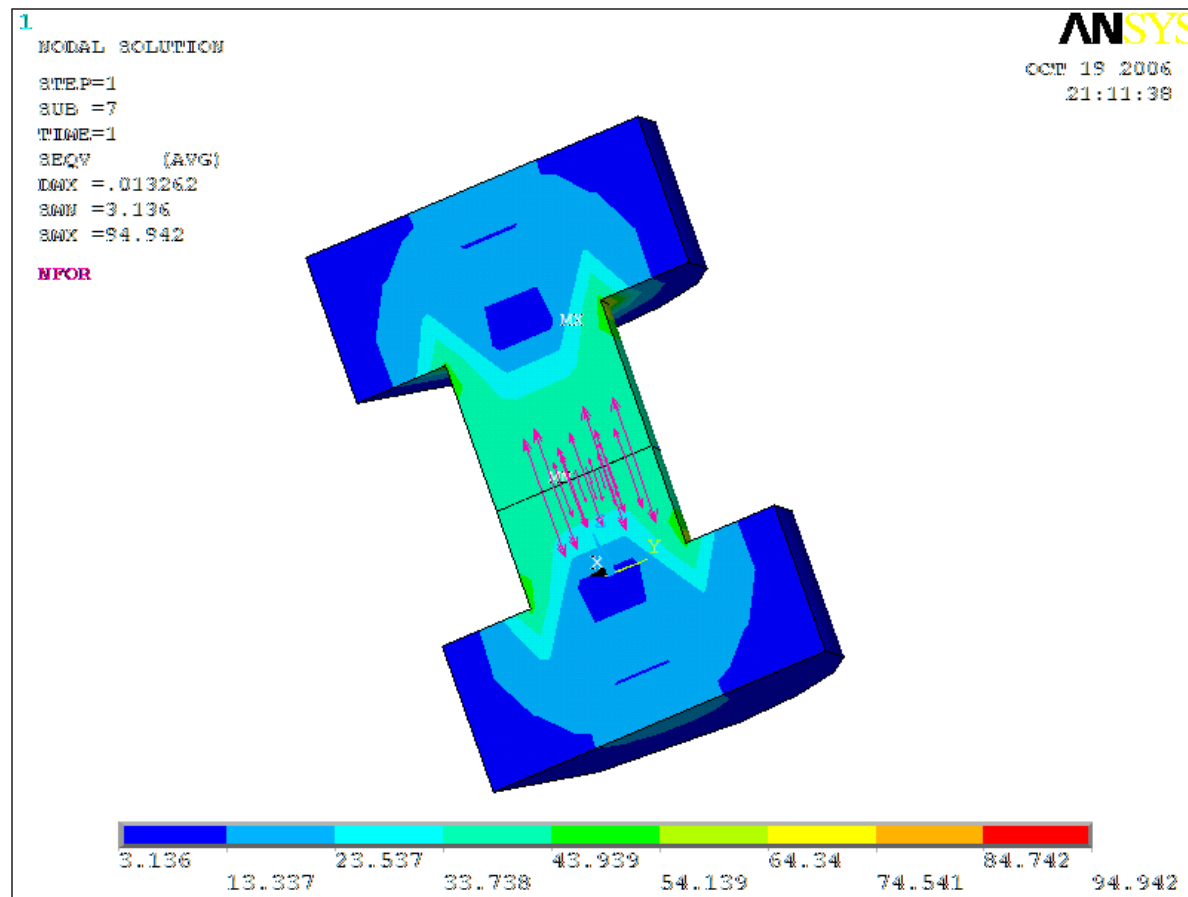


Solution-Joints(without washer)

Constraints and Loads Applied



Pretension force on bolt-1



Contour Plot of Von-Mises Stress-1

