

Maximum Stress in An Assembly using FN2 fits

An assembly is made using three long hollow cylinders of the following nominal radius. Assume plane stress.

- Cylinder 1 - Inner Radius = 2"
Outer Radius = 8.7"
- Cylinder 2 - Inner Radius = 8.7"
Outer Radius = 16.7"
- Cylinder 3 - Inner Radius = 16.7"
Outer Radius = 36.5"

Assuming all cylinders are made of steel ($E=29$ Msi, $\nu=0.3$), find the range of possible interferences and hence the range of Von-Mises stress in the assembly. Assume FN2 fit is used at each of the two interfaces. Use Maple complete with explanations to do this problem completely from fundamentals by assuming the form of radial displacement for axisymmetric problems.