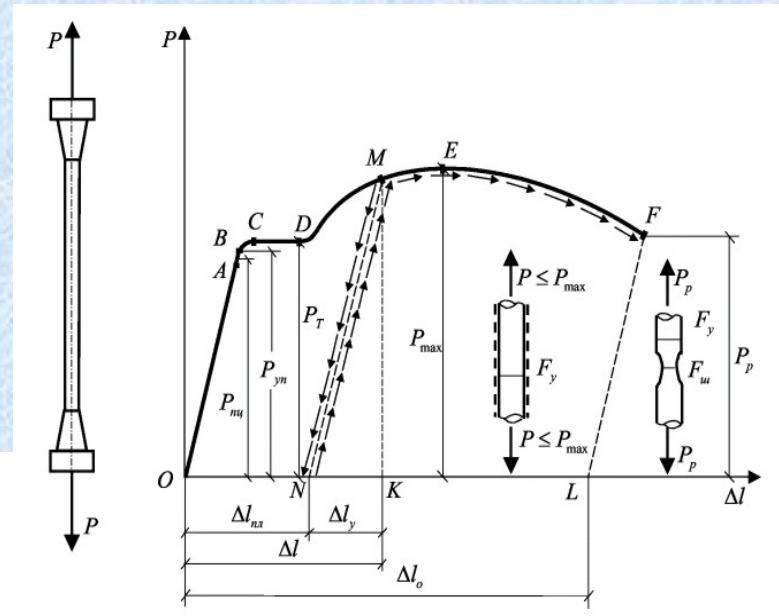
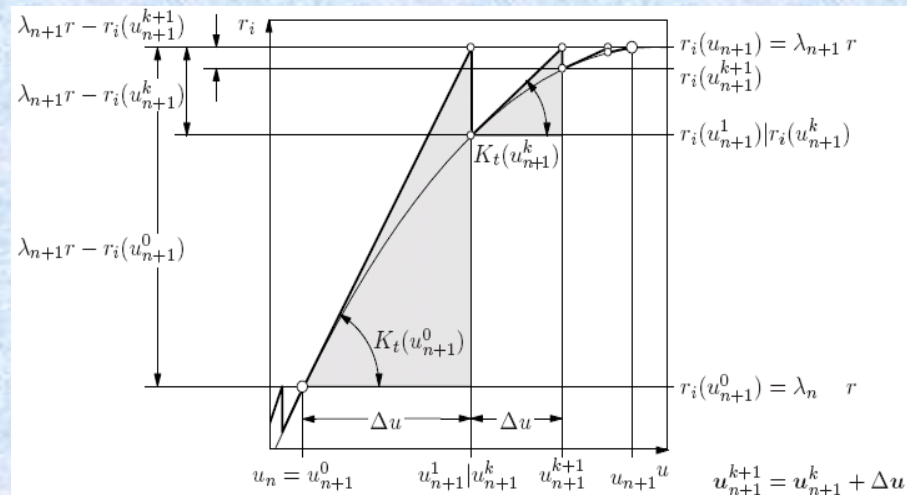


Vježba II - Elasto-plastična analiza

- Nelinearna konstitutivna relacija
- Inkrementalno-iterativni postupak
- konvergencija

Newton-Raphson postupak



Osnovne jednačine teorije plastičnosti:

Aditivna dekompozicija totalne deformacije: $\varepsilon = \varepsilon_{el} + \varepsilon_{pl}$

Elastična napon-deformacija relacija: $\sigma = E \cdot (\varepsilon - \varepsilon_{pl})$

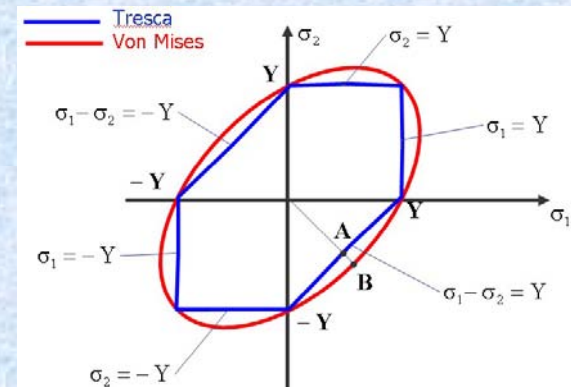
Uslov tečenja : Tresca (1864): $\tau_{\max} = \sigma_1 - \sigma_3 = Y(k)$, $\sigma_1, \sigma_2, \sigma_3$ – glavni naponi

von Mises (1913): $F = (\sigma_x^2 + \sigma_y^2 - \sigma_x \cdot \sigma_y + 3\tau_{xy}^2)^{1/2} - \sigma_0 = \sigma_e - \sigma_0$; σ_0 – napon tečenja pri 1D

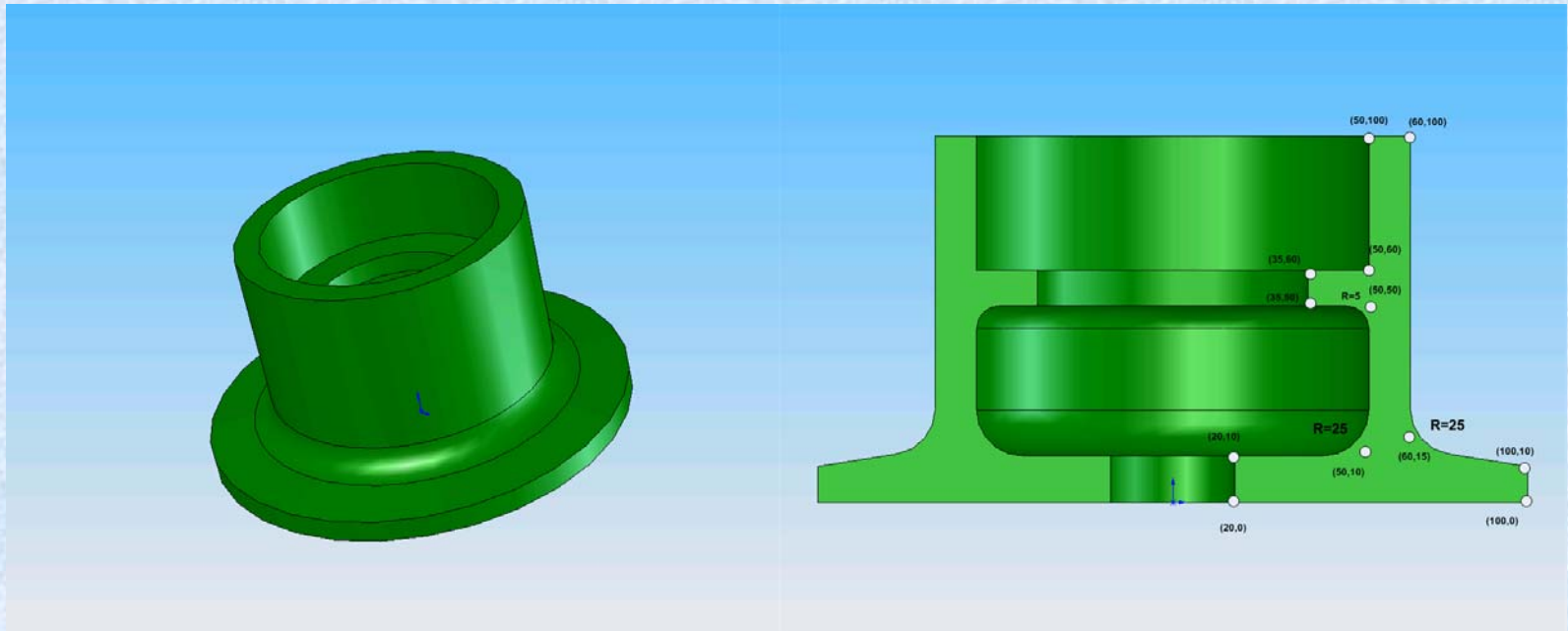
Zakon tečenja (pridruženi): $\dot{\varepsilon}_{pl} = \dot{\lambda} \cdot \frac{\partial F}{\partial \sigma}$

Zakon ojačavanja, opšti oblik: $\bar{\sigma}_0 = f(\bar{\varepsilon}_{pl})$

linearni oblik: $\bar{\sigma}_0(\bar{\varepsilon}_{pl}) = \sigma_0 + H_{iso} \cdot \bar{\varepsilon}_{pl}$

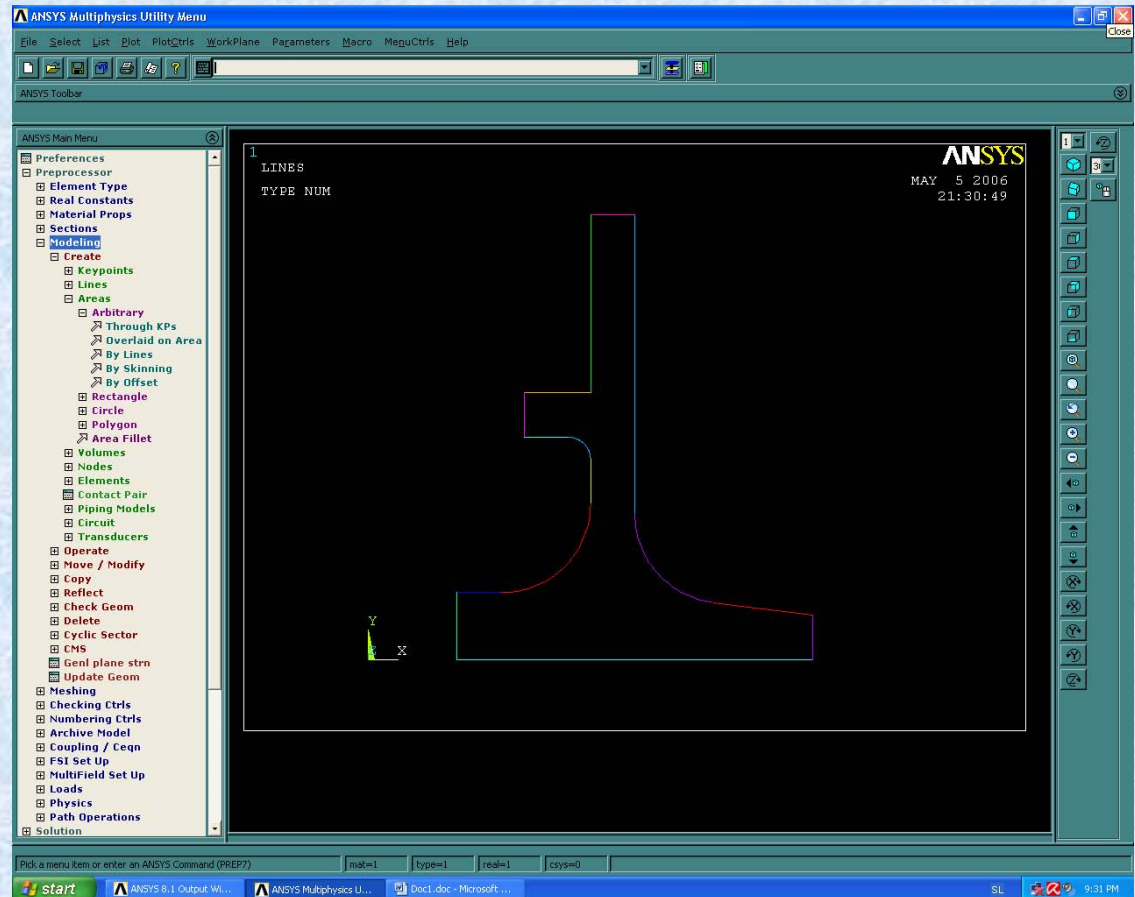


Elasto-plastična analiza aksi-simetričnog oslonca opterećenog po unutarnjem prstenu



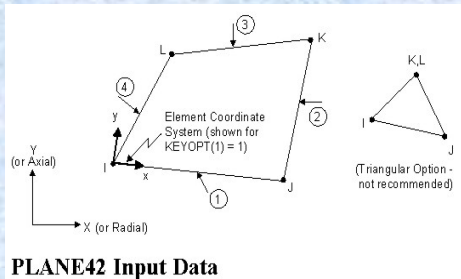
Pre-procesiranje:

- izgradnja 2D modela
- ključne tačke,
- linije,
- površina,
- zaobljavanje...

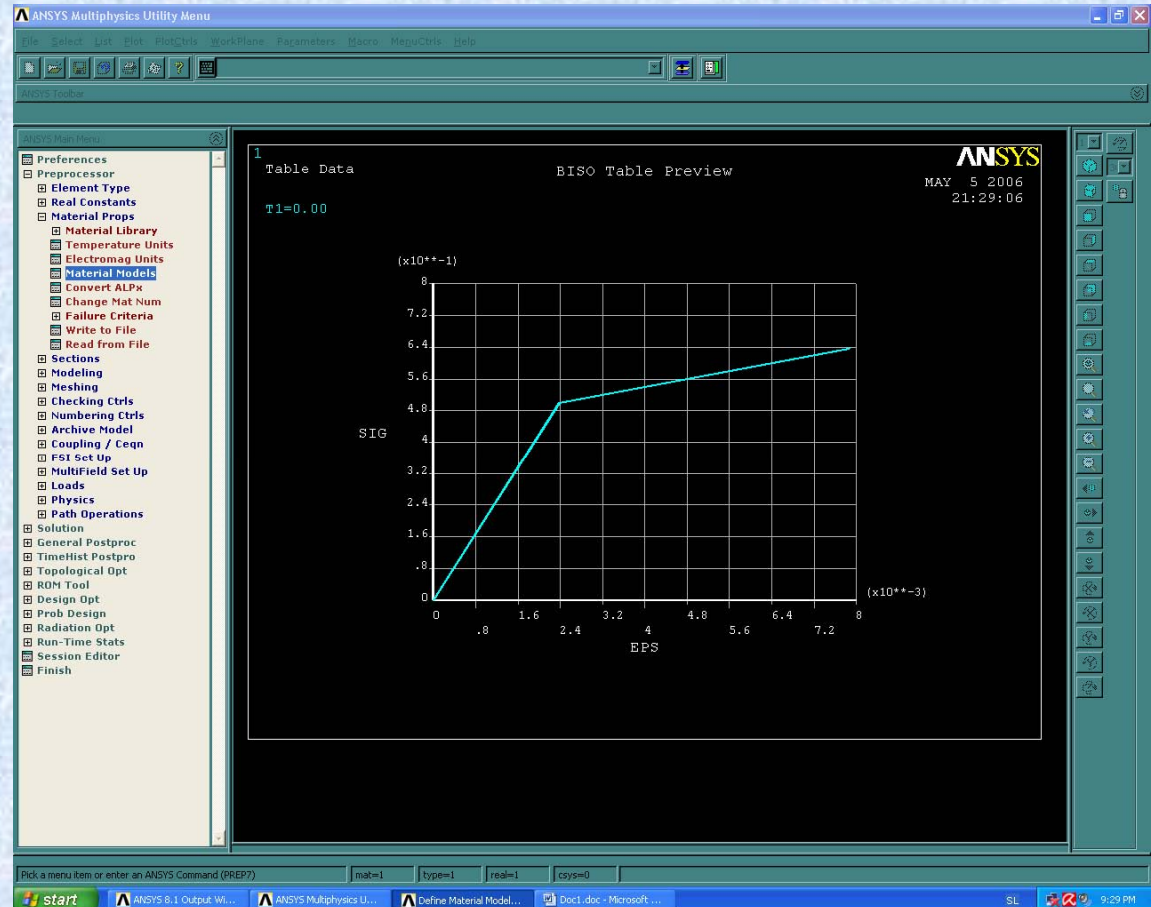


Pre-procesiranje:

- izbor elementa,

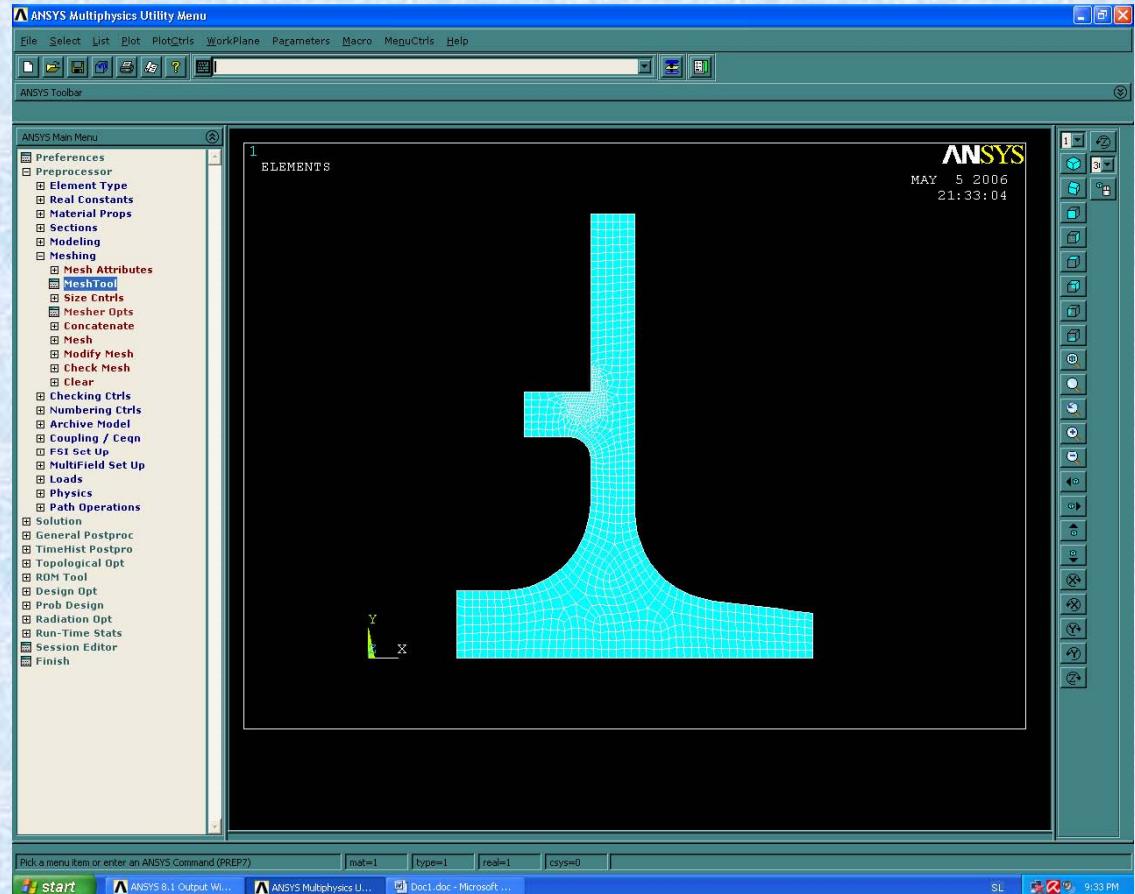


- materijal,
- linearno ojačavanje



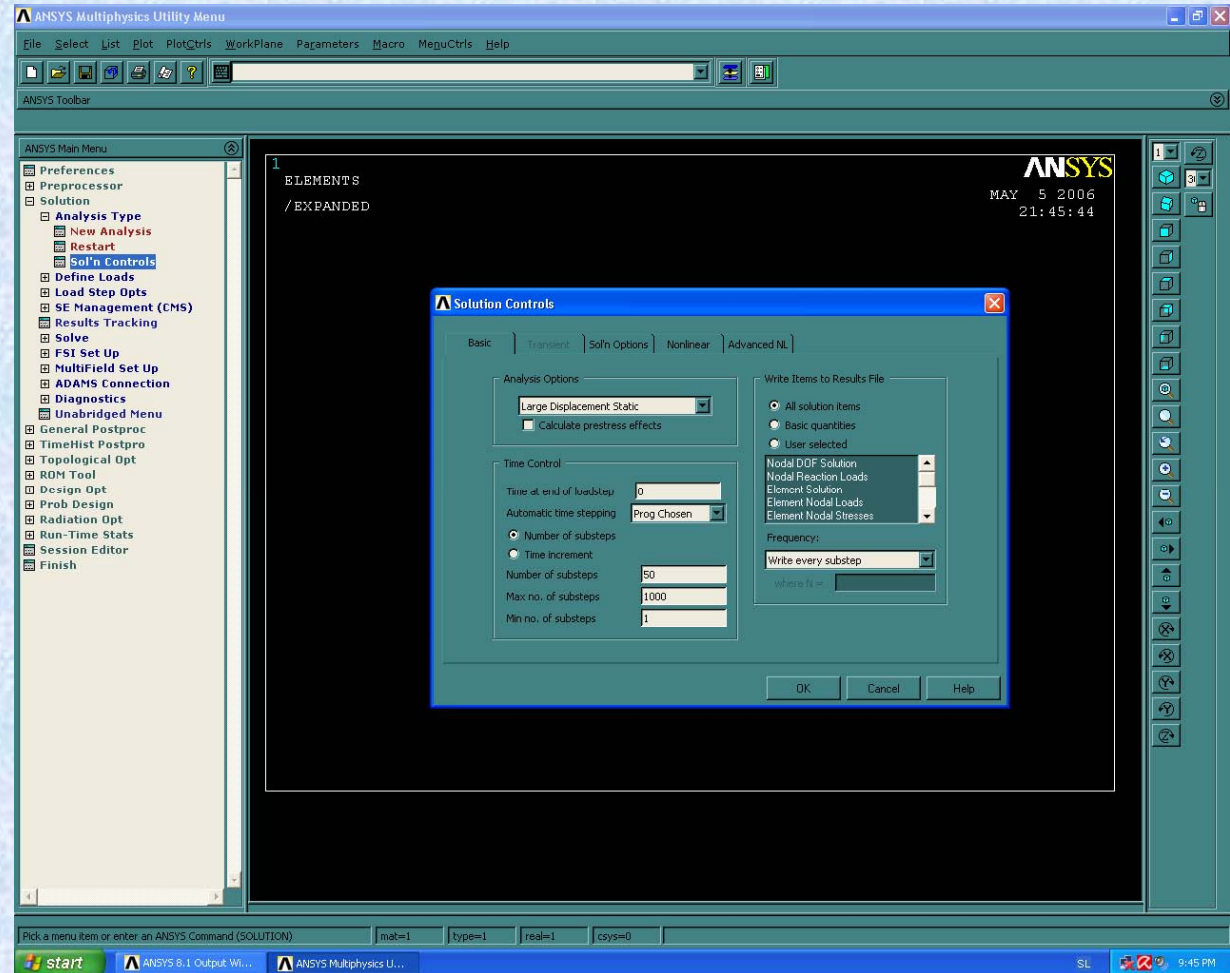
Pre-procesiranje:

- generisanje 2D mreže,
- mesh refinement
- pregled broja elemenata i čvorova



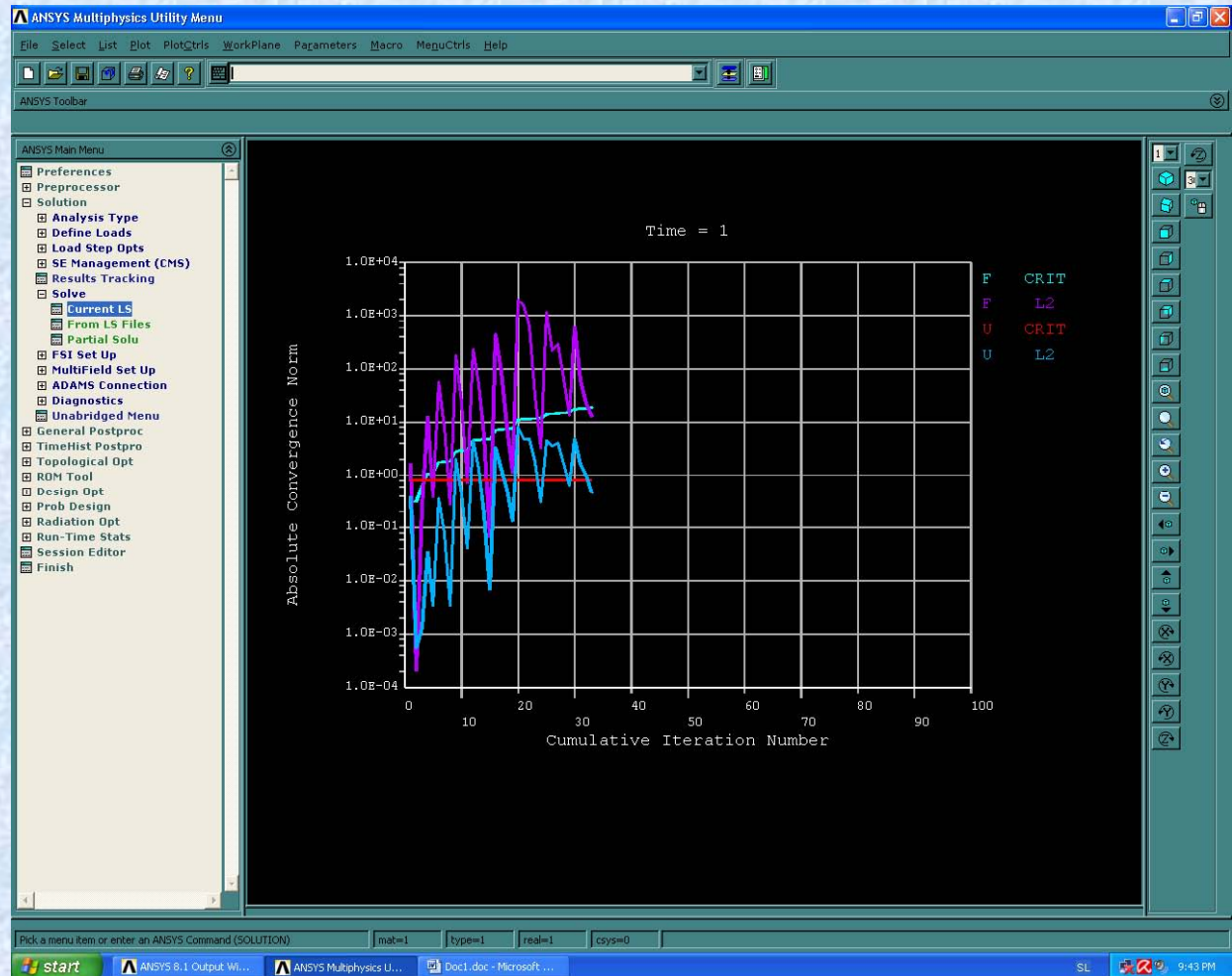
Solver

Zadavanje
parametara
rješenja
(broj inkremenata,
max i min
broj iteracija)



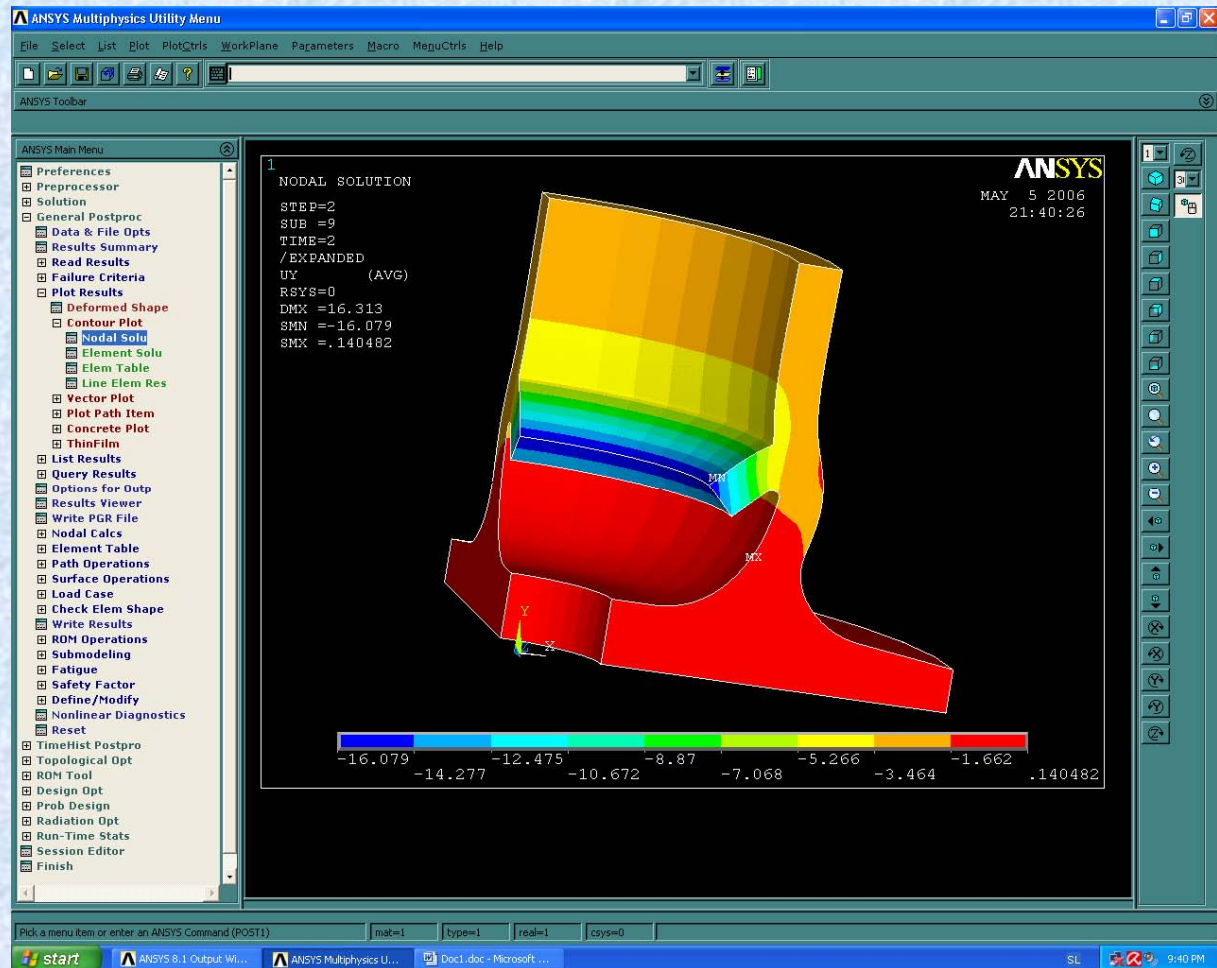
Solver

- Rješenje
- Iteracije
- Konvergencija

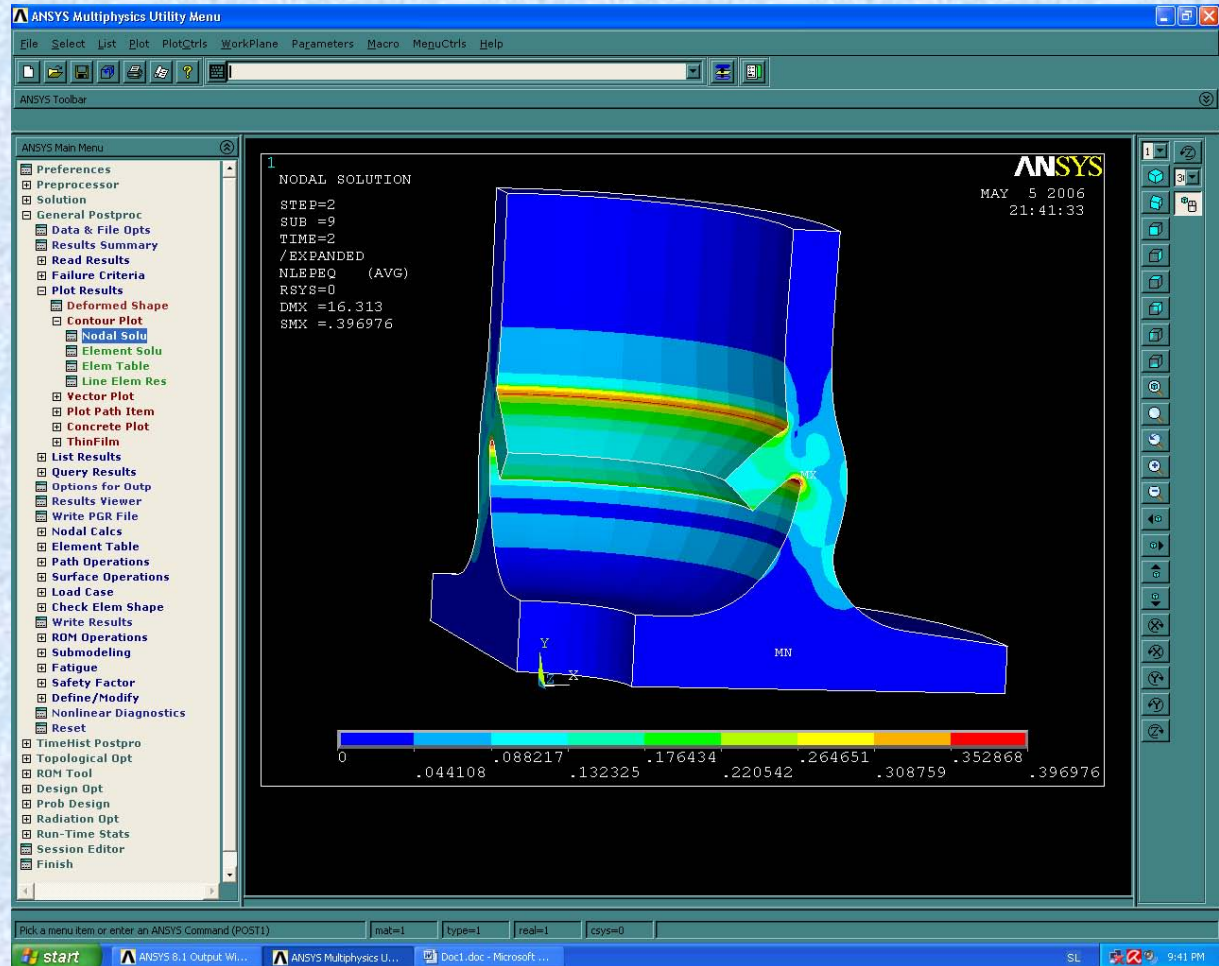


Analiza:

- Axi-simetričan
- 3D model
- Pomjeranje Y
- skaliranje



Analiza:
Ekvivalentna
(akumulirana)
plastična
deformacija



Slijedi prezentacija na PC-ju...(1 čas)