

Enhanced 2D beam modeling

Problem: The modeling of structure members is continuously open to new contribution, due to the increasing request of accuracy in structural analysis and the use of new and complex materials. A promising enhanced beam modeling approach and the corresponding FE was recently proposed and the static answer was investigated. Further investigations could explore the effectiveness of the so far introduced model with respect to complex situations.

Objective: Generalize the enhanced beam model in order to take into account

- 1) effect of anisotropic material,
- 2) dynamical answer,
- 3) buckling.

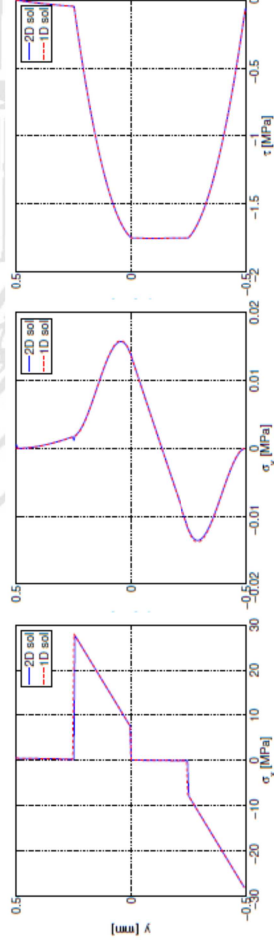
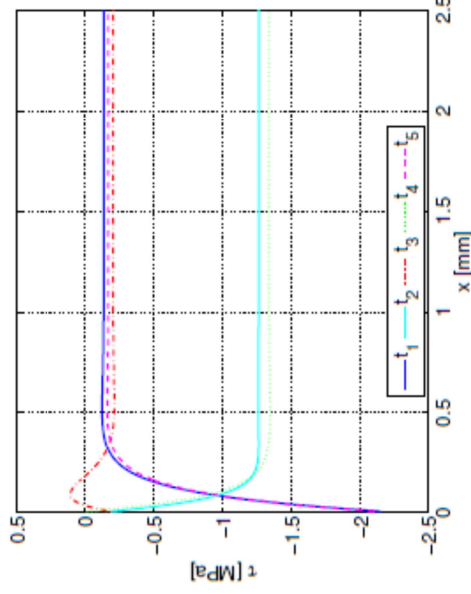
Type: Literature review / Numerical

Prerequisites:

➤ Optional knowledge of numerical and symbolic software calculus (e.g. MATLAB, MAPLE, MATHEMATICA)

References

- Auricchio F., G. Balduzzi, C. Lovadina *A new modelling approach for planar beams: finite-element solutions based on mixed variational derivation*. Journal of mechanic of materials and structure 2010, 5, 771-794
- Dong S.B., J.B. Kosmatka, H.C. Lin *On Saint-Venant's problem for an inhomogeneous, anisotropic cylinder, part I: methodology for Saint-Venant solutions* ASME, Journal of Applied Mechanics 2001, 68, 376-381



Thesis proposal