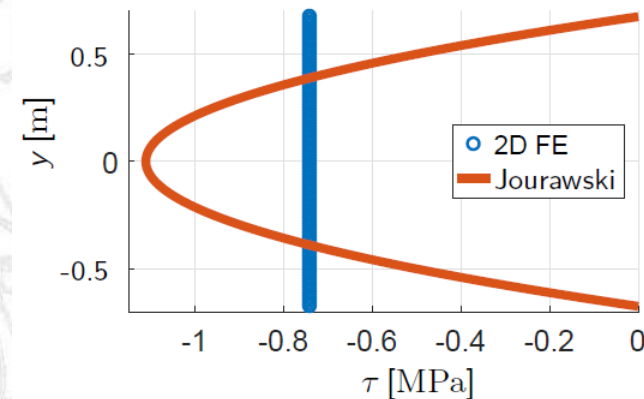
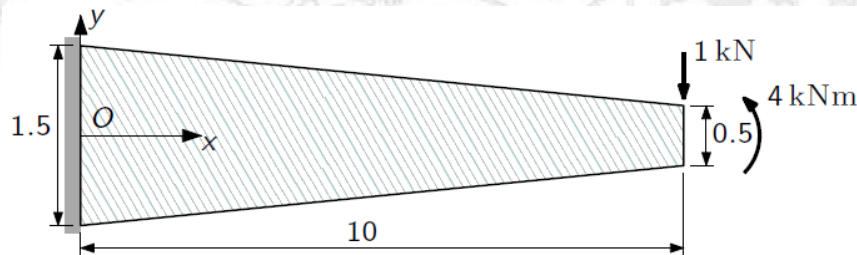


Beams with variable mechanical properties: critical issue and effective modelling

Smooth variations of the cross-section mechanical properties (e.g., the tapering of a linear-elastic planar beam, non-uniform distribution of material properties, smeared defects, ...) lead the shear stress to have a cross-section distribution substantially different from the one occurring in prismatic homogeneous beams. Furthermore, variations of mechanical properties distribution cause both bending moment and axial internal force to produce non-negligible shear stress and deformations, introducing substantial modifications of constitutive relations.

Unfortunately, the peculiarities of these structural elements are often ignored or treated with coarse approaches both in engineering practice and research. The seminar will discuss a Timoshenko-like beam model capable to effectively handle the complex phenomena so far introduced and provide an overview of main critical issues occurring in engineering applications.



Example of non-trivial shear stress distribution in a planar tapered beam ($x=1,5$)

Dr. Giuseppe Balduzzi
Institute for Mechanics of Materials and Structures
Vienna University of Technology

January 8th, 2:30pm
DICAr MS1 Meeting Room
Via Ferrata, 3 – Pavia