Nonlinear analysis of functionally graded nanoscale beams incorporating the surface energy and microstructure effects

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Highlights

- Nonlinear nonclassical governing equations and boundary conditions of FG nanobeams are exactly derived.
- Modified couple stress and surface elasticity theories are used to consider small scale effects.
- GDQM is presented under nonclassical boundary conditions.
- Nonlinear bending responses of FG TBT and EBT nanobeams are investigated.
- The power law and Mori-Tanaka models are used to model the variation of bulk and surface parameters.