

Nonsmooth Problems with Applications in Mechanics  
Bedlewo, Poland, June 17-22, 2023

## **Buckling of the Gao Beam Under Combined Loading**

Horymír Netuka

Faculty of Science, Palacký University, Olomouc, Czech Republic

[horymir.netuka@upol.cz](mailto:horymir.netuka@upol.cz)

**Abstract:** This is a kind of free continuation of the contribution "Buckling of the Gao beam under axial loadings". Now we will consider the Gao beam in a more complex situation, where the buckling is caused by both axial and transverse loading. In a mathematical sense, buckling is a bifurcation in the solution of the static equilibrium equations because the total potential energy of the beam becomes non-convex once the axial load reaches a certain limit value. The problem is difficult to analyze, but a number of examples will be demonstrated that show the determination of the limit or critical load, as well as some bifurcation diagrams of the obtained post-buckling solutions.