Buckling and Post-buckling Behavior of Slender Columns Under Cylindrical Constraint: Post-print

Authors: Jiang Na, Du Changcheng, Sun Qiangqiang

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Abstract

This study investigates the buckling and post-buckling behavior of elastic rods under axial force with cylindrical lateral constraint. Through finite element simulation, the axial critical forces for sinusoidal and helical buckling of slender compression rods are analyzed, a method for determining the critical points of sinusoidal and helical buckling is proposed, and the correctness of the analysis is verified by comparison with literature results. Simultaneously, the influence of factors such as slenderness ratio and boundary conditions on the critical force is examined. The results indicate that both the sinusoidal buckling critical force and the helical buckling critical force increase with decreasing slenderness ratio of the rod. For rods within a certain length range, the influence of end constraint conditions on the critical buckling load and mode cannot be neglected; when the rod length is sufficiently long, the influence of boundary conditions on the critical load can be ignored.

Full Text

Preamble

[The remainder of this section consists of corrupted text and OCR artifacts that do not contain translatable content.]

Note: Figure translations are in progress. See original paper for figures.