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An Laudau-Lifschitz theory based algorithm on calculating post-buckling configuration of a rod buckling in elastic media SHICHENG HUANG, LIKUN TAN, NAN HU, HANNAH GROVER, Dartmouth College, KEVIN CHU, velexi corporation, ZI CHEN, Dartmouth College — This reserach introduces a new numerical approach of calculating the post-buckling configuration of a thin rod embedded in elastic media. The theoretical base is the governing ODEs describing the balance of forces and moments, the length conservation, and the physics of bending and twisting by Laudau and Lifschitz. The numerical methods applied in the calculation are continuation method and Newton's method of iteration in combination with spectrum method. To the authors' knowledge, it is the first trial of directly applying the L-L theory to numerically studying the phenomenon of rod buckling in elastic medium. This method accounts for nonlinearity of geometry, thus is capable of calculating large deformation. The stability of this method is another advantage achieved by expressing the governing equations in a set of first-order derivative form. The wave length, amplitude, and decay effect all agree with the experiment without any further assumptions. This program can be applied to different occasions with varying stiffness of the elastic medai and rigidity of the rod.

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