

A new Approach for Kirchhoff-Love Plates and Shells

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A new approach is introduced for deriving a mixed variational formulation for Kirchhoff plate bending problems with mixed boundary conditions involving clamped, simply supported, and free boundary parts. Based on a regular decomposition of an appropriate nonstandard Sobolev space for the bending moments, the fourth-order problem can be equivalently written as a system of three (consecutively to solve) second-order problems in standard Sobolev spaces. This leads to the design of new discretization methods, which are flexible in the sense, that any existing and well-working discretization method and solution strategy for standard second-order problems can be used as a modular building block of the new method. Essential features of this approach can be extended to Kirchhoff-Love shells.

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