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Stability properties of linked dynamic structures of differing dimension

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Abstract

Linked elastic structures which contain components of different dimensions present theoretical challenges that do not arise for single component models. A nonlinear plate-beam model is considered, composed of a nonlinear von Krmn plate coupled with a nonlinear beam equation with dynamic junction conditions imposed at the interface. Questions under consideration include wellposedness of the model and whether the system can be uniformly stabilized through the use of boundary feedback. The critical role played by the interface will be discussed, as well as the techniques required to overcome the mathematical challenges presented.