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METHOD OF DIMENSIONALITY REDUCTION IN CONTACT MECHANICS AND FRICTION: A USERS HANDBOOK. I. AXIALLY-SYMMETRIC CONTACTS

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Abstract

The Method of Dimensionality Reduction (MDR) is a method of calculation and simulation of contacts of elastic and viscoelastic bodies. It consists essentially of two simple steps: (a) substitution of the three-dimensional continuum by a uniquely defined one-dimensional foundation (Winkler foundation) and (b) transformation of the three-dimensional profile of the contacting bodies by means of a linear transformation. As soon as these two steps are completed, the contact problem can be considered to be solved. For axial symmetric contacts the method is implemented hand is required which does not exceed elementary calculus and will not be a barrier for any practically-oriented engineer. The method is implemented numerically, which is almost trivial due to the independence of the foundation elements. In spite of their simplicity the methods are implemented numerically, which is almost trivial due to the independence of the foundation elements. In spite of their simplicity the methods are implemented numerically, which is almost trivial due to the independence of the foundation elements. In spite of their simplicity the methods are implemented numerically, which is almost trivial due to the independence of the foundation elements. The present paper is a short practical guide to the MDR.

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