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## Finite strains: Objective rates, conjugate stress tensors, constitutive equations for composite materials

Golovanov A.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

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### Abstract

Theoretical problems of the kinematics of continuum under the conditions of finite strains are considered; the technique for development of constitutive equations for isotropic and composite hyperelastic media is presented. A system of principal directions of the left and right tensors of distortions that determine material (Lagrangian) and spatial (Eulerian) tensors are taken as a basis. Such an approach allows construction of stress tensors conjugate to any strain tensor which is demonstrated by a number of examples. 2152-2057/10/\$35.00©2010 by Begell House, Inc.

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### Keywords

Composite material, Conjugate stress tensors, Constitutive equations, Finite strains, Material and spatial strain tensors, Objective derivatives