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Nonisothermal deformation of an elastoviscoplastic flat heavy layer

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Abstract

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We give a solution to the thermoplasticity problem on the slide of a heavy layer from an inclined plane under heating. The reason for the creep effect is the development of a viscoplastic flow due to the dependence of the yield strength of the layer material on temperature. In the framework of large deformation theory we indicate a law of propagation for the elastoplastic boundary, calculate stresses, deformations, and deformation velocities both in the thermoplastic deformation region and the flow region. © 2013 Pleiades Publishing, Ltd.

Author keywords

elasticity; large deformations; plasticity; thermal conductivity; viscosity

Indexed keywords

Deformation region; Deformation velocity; Elasto-plastic boundaries; Elasto-viscoplastic; Inclined planes; Large deformation theories; Thermoplasticity; Viscoplastic flows

Engineering controlled terms: Elasticity; Plasticity; Thermal conductivity; Viscosity

Engineering main heading: Creep

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