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Fully Lagrangian Method For Shear Band Capturing

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The phenomenon of strain localization is widespread and can reveal both during the geodynamic sliding

of plates at macro scale length and at scales, character to a wells and mining. Herein we propose

accurate way to solve problems based on the spectral Legendre element with incremental formulation,

elastoplastic deformations, a consistent linearized matrix for governing relations. Two models of materials

are taken into account: the Drucker-Prager (pressure dependent) model and the Mises (pressure insensitive) model. This report presents a qualitative and quantitative analysis of the kinematic pattern of

the lines of plastic deformations at different characteristic scales and types of stress states. It is shown for

general case pressure dependent Drucker-Prager model, in contrast to Mises model, solution can not possess

symmetric and continuous values: both radial and hoop stresses in the case of thick-walled cylinder

under compression can have periodic symmetry, but are discontinuous along the thickness.