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Nonlinear behavior of saturated porous crust under the influence of internal fluid source

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We consider the effective stress evolution inside high porosity fault zone as a result of local dehydration due to heating. The rock is assumed to be a two-velocity medium; it consists of a deformable porous matrix (with Maxwell's rheology) and a Newtonian liquid that saturates this matrix. Nonlinear behavior of liquid saturated porous media in gravity filed under the influence of internal fluid source is modeled. The elaborated non-isothermal mathematical model is a thermodynamically consistent and closed model. The original scheme was used for computer simulation; the method implies numerical simulation for effective stress, deformation and flux time- space evolution. Deformation spreading through the saturated porous matrix occurs with pressure distortions. Calculations show that the peculiarity of effective stress evolution is dependent not only upon the volume of supplementary fluids, but upon the viscosity and elastic modules of matrix.