

## Numerical simulation of plate-mantle convection system including viscoelasticity

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We have developed numerical scheme to solve set of equations for a viscoelastic fluid in order to understand dynamics of plate-mantle coupled systems. We use a Maxwell fluid as a model of viscoelasticity. A finite difference method base on control volume formulation is adopted to the equations to describe our model. We apply our code to simulation of subduction initiation at the continental margin. Our results show that motion of a stiff plate in the viscoelastic case is realized in the parameter range in which it does not occur in pure viscous models. The plate in the former can deform more than the latter because the elasticity shear the strain with the viscosity. The other role of the elasticity is a storage of the energy by the negative buoyancy to concentrate yielding of the plate.