



FANTOM3Dsp : coupling a thermo-mechanically coupled 3D creeping flow solver with a surface processes model

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The FANTOM3D code is a finite element code for the solution of the Stokes and energy equations that has been purposely designed to address crustal-scale to mantle-scale flow problems in three dimensions. The code is based on an Arbitrary Lagrangian-Eulerian description of the flow field and allows for large deformations of the free surface. A variety of rheologies has been implemented including thermally activated creep and plastic frictional deformation. The large system of algebraic equations that results from the finite element discretisation of the basic partial differential equations is solved using a massively parallel direct solver. The code has recently been coupled with a surface processes model and we will present preliminary results of numerical experiments designed to study the response of a layer of crustal material subjected to convergence and to surface processes such as erosion and/or sedimentation.