Numerical solutions of an elastic-gravitational model by the finite element method

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Elastic-gravitational model allow the computation of gravity, deformation, and gravitational potential changes in order to investigate crustal deformation Earth (see [2] and [3]). This model can be represented by a coupled system of linear parabolic (for the deformations) and elliptic PD equations (for gravitational potential changes) (see for instance [4], [5] and [1]).

We have considered the internal source as response to the effect of a pressurized magma reservoir into a multilayered, elastic-gravitational earth model.

We present the numerical analysis of such a coupled model by means of the finite element method for the steady model. Finally, we present some numerical tests in meaningful situations confirm the predictions theoretical order of convergence.

References

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