

A new algorithm for the computation of dislocation in the spherically viscoelastic Earth model

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We introduce a new algorithm by which to compute global postseismic deformation in a spherically symmetric viscoelastic Earth model. Previous algorithms are based on simplified Earth models that neglect self-gravitation, compressibility, and the continuous variation of the radial structure of Earth, for example. This is because the previous mode summation technique cannot avoid intrinsic numerical difficulties caused by the innumerable poles that appear in a realistic Earth model that considers such effects. In contrast, the proposed algorithm enables all of these effects to be taken into account. We carry out numerical inverse Laplace integration, which allows evaluation of the contribution from all of the innumerable modes of the realistic Earth model. Using this method, a complete set of Green's functions is obtained, including functions of the time variation of the displacement, gravity change, and the geoid height change at the surface for strike-slip, dip-slip, horizontal and vertical tensile point dislocations. In this study, we illustrate the new method for the calculation of the viscoelastic dislocation Love numbers, and indicate the applications for the subduction zone and the repeated faulting. And we publish the calculation programs and explain the specification.