Viscoelastic response of eccentrically-nested spheres to surface toroidal traction

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We present a semi-analytical solution to the 2-D forward modelling of viscoelastic relaxation in a heterogeneous sphere consisting of a concentrically-nested elastic lithosphere and a viscoelastic mantle, and an eccentrically-nested viscoelastic core. Several numerical methods for 2-D and 3-D viscoelastic relaxation modelling have been applied recently, including 3-D finite-element and spectral-finite-difference schemes. The present semi-analytical approach provides a model response that can be used to validate more general numerical algorithms. The solution for the eccentrically-nested sphere model has been tested by comparing it to the analytical solution for viscoelastic relaxation in concentrically-nested spheres and with the time-domain, spectral finite-element numerical solution for viscoelastic relaxation in eccentrically-nested spheres and excellent agreement has been obtained.