THE INITIAL-VALUE APPROACH FOR TRANSIENT VISCOELASTIC RESPONSES OF COMPRESSIBLE EARTH MODELS WITH COMPLEX VISCOSITY PROFILES

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The initial-value theory has been developed for studying viscoelastic responses of realistic compressible earth models with complex viscosity profiles. The available normal-mode approach is best suited for simple layered models, long wavelengths and time scales greater than several thousand years. Occurrence of areas with densely distributed poles in Laplacian spectra, accompanying compressible and densely stratified models, makes obstacles to usual inversion techniques, resulting in incomplete time-domain relaxation curves. Our recently announced initial-mode approach avoids such difficulties by the discretization of the problem in the time domain. The feature of gradually emerging time-domain relaxation curves makes the new approach indispensable in treating short time-scale processes, e.g., postseismic or tidal deformations. High sensitivity of predicted horizontal motions to the completeness of modal expansions, especially for models with a sharp-profiled low-viscosity zone, is demonstrated. Thus, necessity of keeping up with precise geodetic methods of new generation (VLBI) is another reason for our modification of the standard theory.

Submittal Information
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2. Society Symposia EGS1 - 03, Ice Sheets, Sea Level and The Solid Earth
3. Dr. Detlef Wolf
4. —
5. Poster presentation preferred.
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