



A model for viscoelastic waves propagation and its validation

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Viscoelastic media are characterized by their property to absorb wave's energy. This absorption is due to their own viscosity. The viscosity is modelled by adding to wave propagation velocities imaginary parts, expressed in functions of the quality factors. These factors are useful to quantify the viscosity of the medium.

To study high frequency wave propagation in 3D, isotropic, inhomogeneous and viscoelastic media, we have developed the mathematical model of ray theory, using complex wave propagation velocities. Our model is valid only in the slightly absorbing media, because the imaginary parts of these velocities are assumed to be small compared to their real parts. This condition is not so restrictive, especially in geophysical domain.

To validate our model we have compared it with another one, using an integral transformation method (calculation in frequency and wave-number domain). For this purpose a numerical example has been proposed to complete the analytical study. The numerical results of the two models have been compared and discussed.