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An Efficient Solver for a New Pure-anisotropic Wave Equation

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Considerable work has been published on the modelisation of propagation in anisotropic media through pseudo-acoustic wave equation models. However, these wave equations suited for numerical implementation remain computationally demanding and generate artificial pseudo shear-waves that spoil any seismic imaging process. Liu et al. [Liu et al., Geophysics 2014, 79(3), T(117-124)] introduced an explicit time evolving scheme for the constant-density acoustic wave equation in heterogeneous and isotropic medium. We show this ETE scheme can naturally be extended to compute generic pure-anisotropic wave propagation in heterogeneous media. While being efficient and simple, our new wave propagation solver describes correctly the anisotropic phase speed and does not generate artificial shear-waves. Numerical experiments we present illustrate this point for the specific TTI anisotropy model.

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