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Physics of the Earth Seminar

Numerical Rock Physics: Underlying FD Techniques and Applications

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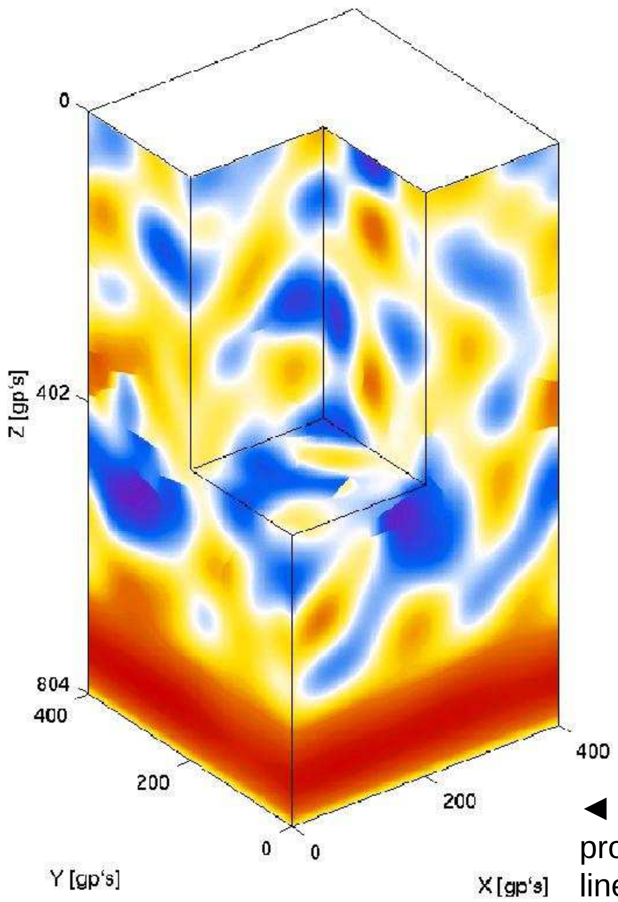
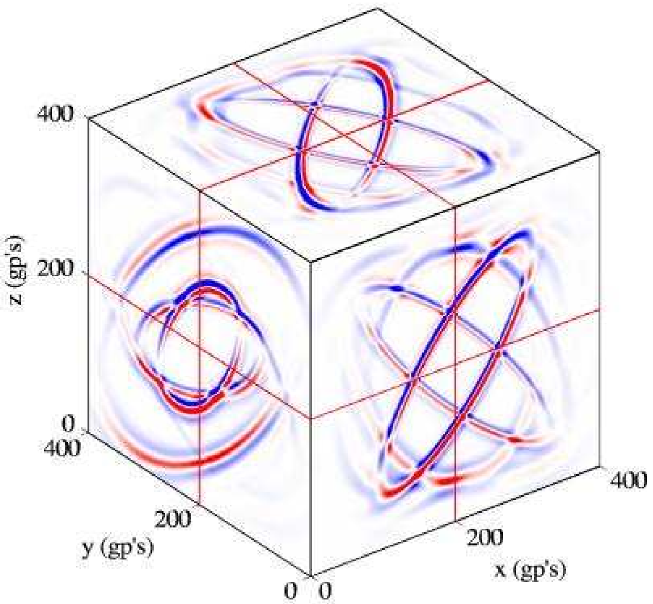
Wednesday 21. 9. 2005 at **10:00** in **F1 219**

Abstract
The goal of 'Numerical Rock Physics' is to establish a third possibility to consider rock physical relationships apart from theoretical and laboratory methods. The main focus here is on elastic properties of multiple fractured rocks. I present the underlying rotated staggered grid (RSG) finite-difference method as tool for numerical solutions of the wave equations for anisotropic (up to triclinic) and viscoelastic media. I will confirm that this approach is capable of modelling poroelastic effects with high accuracy.





▲ A snapshot after 720 timesteps (0.63s) of a large-scale 3-D triclinic FD simulation using the rotated staggered grid. All three types of waves (qP, qS1 and qS2) can be identified.

◄ A z-displacement-snapshot of a plane P-wave propagating through a fractured 3D model. We use a non-linear color scale to emphasize the scattered wavefield.