

## **ACOUSTICS2008/1807**

### **Imaging the earth's subsurface via regularized inversion**

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Modern seismic exploration geophysics attempts to construct a model of the earth's subsurface using measurements taken at the earth's surface. The recorded measurements comprise datasets with billions to trillions of samples. Despite the size of the datasets, models are often poorly sampled because of the complexity of the earth's subsurface. Therefore, the resultant model is poorly determined for many components.

The massive size of our problems introduce additional limitations. We are limited to adjoint-based inversion methods, we can never afford to iterate to true convergence, and most importantly we make approximations to the physics in our operators. These limitations introduce spurious events when inverting. Significantly improved results can be obtained by incorporating regularization that incorporates a priori knowledge of the physics and geology into the inversion process.