



## **Reflection seismic and petrophysical investigations over a series of major deformation zones in eastern Sweden**

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The Bergslagen region is one of the most ore prospective districts in south-central Sweden. We will present an overview of results from two nearly 25 km long reflection seismic profiles crossing this region in the Dannemora mining area. Seismic interpretations are constrained by ultrasonic velocity measurements on a series of rock samples, cross-dip analysis, prestack time migration, and swath 3D imaging, as well as by other available geophysical and geological observations. A series of major fault zones is imaged by the seismic data, as is a large mafic intrusion. However, the most prominent feature is a package of east-dipping reflectors found east of the Dannemora area that extend down to at least 3 km depth. This package is associated with a poly-phase, ductile-brittle deformation zone with the latest ductile movement showing east-side-up or reverse kinematics. Its total vertical displacement is estimated to be in the order of 2.5 km.

In order to better understand the nature of reflectivity from the deformation zone, we extended our petrophysical studies to include Laser Doppler Interferometer (LDI) measurements, which are capable of providing information about anisotropy and potentially its system in available rock samples from the deformation zone. Up to 10% velocity-anisotropy is estimated and demonstrated to be present for the samples taken from the deformation zone. To link the lab measurements with the real seismic data, we recently processed the seismic data over the deformation zone using anisotropy parameters obtained from the LDI measurements. A partial improvement of the deformation zone image is obtained. This suggests that rock anisotropy may also contribute to generation of reflections from the deformation zones in the study area.