



## Combining geoelectrics and seismics using a structural constrained inversion approach with an application at the CO<sub>2</sub> pilot storage Ketzin (Germany)

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Geophysical monitoring at the CO<sub>2</sub> pilot storage Ketzin comprises time-lapse seismic and geoelectric (ERT) measurements. Both types of measurements are known to image geological structures differently, in particular for a variable saturation of CO<sub>2</sub>. We present a combination of both methods by means of a structural constrained inversion approach. Structural constraints are implemented in the geoelectric inversion by a local regularization. This allows model parameters to behave discontinuously across prominent geological boundaries. A tetrahedral finite-element parametrization is used to closely follow geometric a priori structures interpreted from seismic reflection data. Thus, seismics and geoelectrics are arranged in a sequential workflow which is based on a structural similarity.

Practical application is performed on the Ketzin datasets which comprise repeated 3D seismic surveys, as well as repeated surface-downhole geoelectric surveys, providing different illumination/coverage and time-lapse signals. However, application of a local regularization for the caprock-reservoir boundary yields a more consistent image and reduces some of the ill-posedness in the ERT inversion. We compare the result with that of an unconstrained inversion and discuss its potential for CO<sub>2</sub> migration imaging.