



Pre-stack and post-stack inversion of 3D seismic reflection data for geothermal reservoir characterization in Groß Schönebeck (NE German Basin)

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3D seismic reflection surveying is known to be a suitable technique to provide necessary information for geothermal exploration including (1) the general geological structure (lithostratigraphy), (2) the location of faults as major fluid pathways, and (3) the distribution of fluids. A 3D seismic reflection survey of 64 km² of subsurface coverage was acquired in 2017 in Groß Schönebeck located 45 km north of Berlin, Germany, at a research platform to test technologies for the geothermal usage of porous and/or fractured sedimentary and volcanic rocks. The target reservoir is at about 4 km depth (the Rotliegend Formation). Main objectives of this seismic survey are to verify earlier geologic interpretations of structure based on vintage 2D seismic and borehole data and planning of new drilling operations. The pre-stack and post-stack seismic inversion is a proven method to provide general geological structure (lithostratigraphy) and information on distribution of fluids at reservoir-related projects of the oil and gas industry and of carbon dioxide storage. In this study the pre-stack and post-stack inversion is successfully applied to the new 3D reflection seismic survey from a geothermal site of Groß Schönebeck. The uppermost 4 km are well imaged including the target reservoir.