



Geophysical monitoring of CO₂ at the Ketzin storage site: the results of the second 3D repeat seismic survey

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Various geophysical methods applied at the Ketzin storage site have successfully imaged migration of the injected CO₂ within the target reservoir zone of the ~ 650-680 m deep saline aquifer. Among them, the 3D time-lapse reflection seismic method has proven to be a very effective monitoring tool for mapping the spatial extent of the CO₂ in the injection reservoir. Results from the first 3D repeat survey conducted in 2009, after about 15 months of injection (~22,000 t), showed that the CO₂ plume was concentrated around the injection well Ktzi 201 with a lateral extent of approximately 300-400 m and a thickness of about 5–20 m. The plume, however, was not radially symmetric, but had a rather westerly trending tendency, revealing the heterogeneous nature of the reservoir.

Following the success of the Ketzin project to date, a second 3D repeat seismic survey was acquired in the Summer/Fall of 2012, when ~ 61,000 tons of CO₂ had been injected. Preliminary results from this survey show further growth and migration of the anomaly which has been interpreted to be induced by the CO₂ injection. The observed amplitude anomaly is similar in shape to the one observed at the time of the first repeat survey, but larger by approximately 100-200 m and much stronger with the highest concentration nearly centered at the injection well. There is still a pronounced westward propagating tendency. The new time-lapse seismic data show no indication of upward migration into the caprock.