Time-lapse seismic AVP analysis on the Sleipner CO2 storage monitoring data using CFP processing

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Summary

CO2 has been injected into the Utsira Sand at Sleipner since 1996, with more than 11 million tonnes currently in the reservoir. Six time-lapse seismic monitoring surveys to follow the migration of the CO2 in the reservoir have been carried out. This paper describes a pre-stack data analysis of the top-most accumulation of the CO2. The aim is to validate the assumed rock physics framework by comparing the extracted time-lapse pre-stack amplitude versus ray-parameter (AVP) data with the expected response. To this end the application of an innovative processing scheme is proposed to extract the AVP-gathers from the Sleipner data. A clear match can be observed in the trend of the AVP behaviour for water saturated sand versus CO2 saturated sand.