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Numerical simulation on verification of availability of time-lapse seismic survey storing CO₂

Norimitsu Nakata^{1*}, Shinji Kawasaki², Akihisa Takahashi², Ziqiu Xue³, Toshifumi Matsuoka¹

¹Kyoto University, ²JGI, Inc., ³RITE

Three-dimensional reflection seismic survey is one of the prominent methods in monitoring CO₂ injected into deep saline aquifers. We would deploy OBC semi-permanently to CO₂ injection sites. Permanently placed OBC has much merits in CO₂ monitoring, because OBC is suitable for repetition survey and would be low cost compared to other technologies. Repetition survey enables us to collect seismic data by same receiver geometry and would reduce noises from difference of positions or instruments. We build a model based on a real three-dimensional seismic volume and take ray tracing with changing the number of receivers. With this model, we analyzed these three-dimensional seismic data and seismic volume. Our numerical simulation also considered the noise levels and we investigated effects of receiver numbers and noise levels.