

## On the Passive Geophysical Monitoring Research for CO<sub>2</sub> Geological Storage at AIST

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An appropriate monitoring program is indispensable for an individual geological carbon sequestration project to detecting subsurface changes within the reservoir, to provide for potential risk such as CO<sub>2</sub> leakage through the caprock, and to improve the predictive capability of reservoir simulation. Time-lapse seismic method is mainly used to monitor subsurface CO<sub>2</sub> plume and have demonstrated its capability to detect temporal and spacial changes of CO<sub>2</sub> plume in many geological storage site as Sleipner.

However, relatively high cost of time-lapse seismic requires some another monitoring choice, especially for sub-seabed storage typical in Japan. AIST have studied passive geophysical monitoring method to reduce the repetition of the seismic sounding, especially in post-injection period.

In order to investigate the feasibility of passive geophysical monitoring methods for CO<sub>2</sub> geological storage, we carried out reservoir simulations of CO<sub>2</sub> geological storage, and calculated the temporal changes in geophysical observables caused by subsurface changes due to CO<sub>2</sub> injection. We also carried out high-resolution gravity, self-potential and AE(passive seismic) monitoring in Farnsworth test site in USA, where large-scale field testing injecting of CO<sub>2</sub> is carried out by the Southwest Partnership on Carbon Sequestration (SWP). From 2014, we started baseline monitoring of gravity and SP in Tomakomai, where the first demonstration test will be planed from FY2016.

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