

Assessing the geomechanical responses of storage system in geological CO₂ storage: An introduction of research program i

OKUYAMA, Yasuko^{1*}, FUNATSU, Takahiro¹, LEI, Xinglin¹, UEHARA, Shin-ichi², NAKASHIMA, Yoshito¹, Takashi Fujii¹, NAKAO, Shinsuke¹

¹Institute for Geo-Resources and Environment, AIST, ²Faculty of Science, Toho University

The geomechanical responses of CO₂ reservoir and the rocks around the storage region are crucial for Japanese geological CO₂ storage (GCS). The CCS Investigation Commission, METI, recommended screening out the areas having large-scale faults from candidates of a storage site for large-scale demonstration (2009). At present, however, we do not exclude fully the possibility of unintended rock-mechanical motions and leakage due to the storage of pressurized CO₂. The examples of such phenomena are the activation of pre-existing faults, induced seismicity, reservoir failure and unintended uplift and so on. These unintended phenomena are essentially connected with the increase in underground fluid pressure, or pore pressure, around the area of GCS, which is inevitable as GCS injects pressurized CO₂ into an underground reservoir. We are conducting research to develop a scheme how to assess a possible increase in underground fluid pressure and possible geomechanical responses around a storage region of CO₂, under the geological conditions postulated in GCS sites in Japan. We consider that the coupled simulation of fluid flow and geomechanics is the most important tool in developing the scheme of assessment. Our final goal is to make such a tool to be applicable to Japanese young sedimentary areas in which we cannot exclude the possible presence of small-scale fractures even after the intensive seismic survey. We will present the detail on the objectives, the whole structure, and the present status of the research program in poster presentation. This research is funded and supported by METI.

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