

Development of near real-time monitoring system for CO₂ injection

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CO₂ injection into a reservoir perturb pore pressure state and may trigger seismic activity at geological structures that are already in critical condition due to existing stress field. Seismic activity around CO₂ injection site could be related with enhanced permeability of fractures, reactivation of pre-existing faults or generation of new fractures. If the seismic activities are located above the injection point (or at the overlying rocks), then the injection operation need to be managed (i.e. its injection rate) in order to ensure cap-rock stability for long-term reservoir containment. In this study, an automated technique is developed to realize real-time seismic activity monitoring. Real-time monitoring system could be applied during injection operation and will provide useful information to control injection rate. As an exemplary application of the developed system, time evolution and spatial distribution of seismic event (seismicity) at Aso volcano, central Kyushu island, will be presented. The presented method can resolve a spatial resolution that can identify different clusters of seismicity associated with different stress condition