

SCG068-P01

Room:Convention Hall

Time:May 22 11:45-12:45

Evaluation of long time deformation around Horonobe area using modelling techniques

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Nuclear power generation has a problem of emission of high-level nuclear waste. It will take several tens or hundreds of thousands of years that radioactivity of waste does not harm human body. Deep geological disposal may be appropriate for permanent disposal, but it is necessary to evaluate the safety of disposal system by predicting long-range geological movements. Uplifted geology may be easily eroded and this makes underground facilities to be shallow to the surface. Overburden decreases by denudation may also activate pre-existing faults. We performed analogue model experiments which incorporate uplift and denudation, and evaluated geological movements of an on-shore thrust belt for a million years.

The analogue model experiments were to observe forming process of geologic structures in a laboratory. In this study, we simulated fold-and-thrust belt by compressing dry sand whose deformation behaviour is similar to that of the upper crust. Uplifted sand was eroded at constant time interval during a series of experiments to observe the effect of the frequency of denudation. We also recorded images of cross section to analyze structural behaviour with digital image correlation (DIC) technique that can estimate velocity and shear strain in the images by tracing mass of particles between each image.

The results show that the structural movement is basically similar in every experiment thus experimental configurations will not affect the results.

Keywords: geological disposal, geological structure, denudation, analogue model experiment