

## New modelling devices to enhance the reproducibility of analogue model experiments

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The scaled analogue model experiments have been used for more than 100 years to reproduce the geological development processes in the laboratory scales using the granular material (e.g. dry sand). Recently, we can obtain the small-scale deformation quantitatively by applying digital image analyses. Then, we observed the 'weak shear band' before fault initiation process. However, heterogeneity in the initial model produced by human hand often causes the fluctuation of the experimental results (e.g. fault location, faulting timing and fault geometry).

To solve this problem, we made the experimental device for making the initial model automatically and conducted the experiments to compare the experimental results with the previous method.

We conducted simple convergent experiments. Initial models were made by previous method (human hand) or new method (new device) and experiments were repeated 5 times, respectively.

As a result, while branches of new faults can be seen in the previous method, there are no branches in the new method. In addition, the fluctuation of experimental results was restricted in the new method.

This shows that new experimental device can make the initial model homogeneous and reproduce the same initial model in each experiment.

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