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# Experimental modelling of the Karatau structural complex (the Southern Urals)

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## Résumé

The Urals is an example of a Paleozoic orogen which extends for nearly 2,500 km and represents the conditional border between Europe and Asia. Geographically (from north to south) it is divided into Polar, Cis-Polar, Northern, Middle and Southern Urals. One of the most geologically complicated structures of the Southern Urals is the Karatau structural complex (KSC).

The KSC territory is a peculiar feature of the Urals with a sublatitudinal strike unlike other major structures of the Southern Urals. It abruptly advances the deformation front of the Urals to the west and divides the Pre-Uralian foredeep into two parts. It is limited by faults on all sides and brings Meso-Neoproterozoic rocks (1650–540 Ma) at the surface. A hypothesis, based on Kamaletdinov's and Brown's ideas was put forward explaining the peculiarities of the Karatau complex formation: a high angle (almost perpendicular) compressional inversion of a former extensional sedimentary basin (Upper Riphean rift basin) determined the westward advancement of the deformation front. It was influenced by two major factors: 1) pre-existing normal faults, which later acted as faults with a strike-slip component; 2) a deeper detachment within the KSC.

We use experimental ('sandbox') modelling to better understand the kinematic and mechanic evolution of the KSC. We follow a simple, rather classic approach, using a rigid box with fixed side walls except the so called moving back wall that is translated towards the center of the box to produce a horizontal shortening of the material inside. Two rigid plates made of foam board are put on the base of the sandbox, leaving a deeper central part corresponding to the territory of the KSC. With this experimental set-up, we focus on testing the influence of the deeper central part detachment and of the pre-existing rigid ramps (frontal and lateral). Experimental modelling made it possible to recreate the general features of the KSC.

**Mots-Clés:** Southern Urals, Karatau structural complex, rift basin inversion, experimental modelling

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