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New Analog Experiment for Convergent Regime an example of planet Mercury

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We conduct a series of experiments to understand the nature of thrust faulting as a result of global thermal contraction in planetary bodies such as Mercury. The spatial scales and patterns of faulting due to contraction are still not very well understood. However, the problem is complicated even for the homogeneous case where the crustal thickness and material properties do not vary spatially. Previous research showed that the thrust faulting patterns are non-random and are arranged in long systems. This is probably due to the regional-scale stress patterns interacting with each other, leading to the creation of coherent structures. We first conduct 1-Axis experiments where we simulate the contraction of the substratum using an elastic ribbon. On top of this we place the material for which the friction, cohesion and thickness can be controlled for each experiment. The shared interface between the frictional-cohesive material and the shortening elastic substratum dictates undulations and finally the generation of slip planes in the upper layer. We discuss the spatial distribution of these patterns spatially. We then speculate the interaction of such patterns on a 2D plane.