

## **Sheets within diapirs – Results of a centrifuge experiment**

C. Dietla, Hemin Koyib

### **Abstract**

We carried out a centrifuge experiment to model the diapiric rise of a stratified PDMS layer from three perturbations through a non-Newtonian, ductile overburden. The experiment carried out at 700 g resulted in three composite diapirs fed by different PDMS layers. The three resulting diapirs represent two different stages of diapirism. One of the diapirs (diapir 1), which reached its level of neutral buoyancy and extruded at the surface of the model, was tabular in profile and copied by an internal intrusive body. The other two diapirs (diapirs 2 and 3) were still in the ascending stage when centrifuging was stopped and thus did not extrude at the surface. They displayed a typical balloon-on-string geometry, which develops at a high viscosity contrast between a highly viscous overburden and a less viscous buoyant material. The internal geometry of these last two diapirs, fed by the lower impure PDMS, however, did not copy the shape of their precursors. Instead, they had a finger-like shape. The finger geometry of the internal part of the diapirs might be the result of the higher viscosity of the impure lower PDMS intruding a less viscous clean PDMS. Compared to nature, diapir 1 represents a fully developed concentrically expanded pluton or nested diapir, while diapirs 2 and 3 resemble composite plutons which host magma batches of dyke-like geometry. Based on the results of our experiment we suggest that truly concentrically expanded plutons develop from the latter.