



## **Geodynamic modelling of the role of magmatism in basin development**

**Y. Elesin**(1), T. Gerya(2), I. Artemieva(1), H. Thybo(1)

(1) Department of Geography and Geology, Geology Section, University of Copenhagen, 1350 Copenhagen, Denmark, (2) Department of Geosciences, ETH-Zurich, CH-8092 Zurich, Switzerland

Formation, dynamics and evolution of sedimentary basins and rift zones are of great geological and economical interest. Current achievements in computer modeling methods together with progress in computational power of current machines allow us to model these complex processes at high resolution and precision. For these purposes we have developed a comprehensive thermo-mechanical code, which is based on marker and cell technique and employs realistic visco-plastic rheology. The code takes the processes of erosion and sedimentation into account. In the present study we model two different processes which can result in sedimentary basin formation: a) Extension of the lithosphere by far-field tensional stresses and b) hot magma intrusion into the crust and mantle lithosphere. The latter process causes thermal uplift, followed by erosion, which will lead to initial basin formation after cooling and freezing of the magma. We will discuss the general differences in the dynamics of basin evolution and topography for the two types of basin formation.