Surface Topography Anomalies Induced by Geodynamic Processes in the Southeast Carpathians

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Southeast Carpathians with deep basins (e.g., Transylvania and Focsani) and the mountain chain (SE Carpathians Mountain with ~1.5 km elevation) are characterized by unique morphological features. The highly-variable subsurface structures (e.g., Vrancea slab) related to post-collisional tectonics are imaged by geophysical studies. Numerical modeling studies are performed to understand the deformation linked with active geodynamic processes developing in the east part of the region. Here, we present our multi-dimensional (2D-3D) thermo-mechanical modeling results with varying temperatures and crustal configurations. We analyze modeling results together with the observations in terms of possible mantle flow components of the surface topography in Southeast Carpathians. In addition to residual topography calculations, non-isostatic compensation of the elevation is interpreted based on admittance functions between free-air gravity and topography. Our results indicate that mantle flow induced dynamic forces beneath the region modify the elevation with positive amplitudes over the Transylvania Basin (0.8-1 km) and the high SE Carpathian Mountains (~ 1 km) and subsidence of the Focsani Basin (0.5-1 km).