



Isostasy, dynamic topography and the missing root of the Scandes

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The Bouguer anomaly over the Norwegian mountains (Scandes) feature a gravity low along the entire Scandes mountain belt, which is indicating, at least partly, isostatic compensation. In contrast to this observation seismological studies have not imaged a pronounced crustal root along the entire mountain range, which is pointing against simple Airy-Heiskanen isostatic compensation. Regional isostasy expressed by flexural rigidity does not overcome this non-correlation and additional sources have to be considered. Taking into account the geometry of the base lithosphere, isostatic balance can be achieved by introducing a high-density lower crust below the Fennoscandian shield with a thickness up to 25 km, which tapers out below the Scandes. The top of this lower crustal body appears to be the missing root of the Scandes, necessary to explain the overall gravity signal. A second observation is the presence of an additional belt of low-density, but highly magnetic rocks, of the Transscandinavian Igneous Belt, superpositioning the Scandes, and contributing partly to the Bouguer gravity low. However, also this 3D model does not sufficiently explain the topography of the Southern Scandes. Preliminary models of dynamic topography due to mantle density and flow offer an additional component to explain the present topography of the Scandes.