

Effective elastic thickness of continents and its relationship to other proxies for lithospheric structure and surface tectonics

M. Pérez-Gussinyé¹, A.R. Lowry²

Detailed information on the lateral variations in lithospheric properties can aid in understanding how surface deformation relates to deep Earth processes. Unfortunately, the most relevant properties (geotherm, rheology, and depth-dependent density variations) cannot be measured directly and must be inferred from proxies. The effective elastic thickness, T_e , of the lithosphere is a proxy for lithospheric strength. In this talk we show how modern spectral techniques can recover detailed variations in T_e over continental scales, thus providing a measurement of the lithosphere's lateral strength variations and further insight into the relationship between surface tectonics and Earth's deep interior. In particular we focus on T_e variations in Europe, South America and Africa and discuss how they relate to surface tectonics and to other proxies for lithospheric structure such as seismic velocities, anisotropy and heat flow. Finally, we present preliminary work that shows how T_e variations in conjunction with other observables may be used to infer viscosity variations in depth and thus an estimate of the lithosphere-asthenosphere boundary.