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Baikal Rift Zone: Intra-cratonic rifting without Moho uplift

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The Baikal Rift Zone is located in Siberia at the centre of the world's largest continental area. It provides a unique opportunity for studies of the processes of ongoing continental rifting in an area with thick cratonic crust. The BEST project (Baikal Explosion Seismic Transects) aims at providing seismic velocity models of the crust and uppermost mantle across and along the strike of the Baikal Rift Zone. with two ca. 360 km long seismic refraction and wide-angle reflection profiles.

The models of seismic velocity show a gently deepening Moho from the Siberian Craton into the Palaeozoic fold belt to the SE of Lake Baikal without any sign of Moho uplift around the more than 10 km thick sedimentary graben structure. Strong seismic reflectivity slightly offset to the NE from the rift zone indicates the presence of pronounced magmatic intrusions in the lower crust, despite of the non-volcanic appearance of much of the rift zone. These intrusions may have compensated rifting associated lower crustal thinning. Further there is no sign of any reduction of the seismic Pn wave velocity around the rift zone. These features indicates that the existing models of continental rifting may not be adequate for describing the underlying processes in thick, cratonic lithosphere.