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Apatite fission-track thermochronology of the Tunka Range, eastern Sayan Mountains and the southern Baikal rift area: preliminary results

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The continental Baikal Rift Zone (BRZ) in Central Siberia accommodates the famous Baikal Lake. The latter is composed out of three main basins, the North, Central and South Baikal basins. To the west of the South basin, large fault zones, controlling the tectonic evolution and formation of the BRZ, splay off to the interior of the Siberian continent. One of the most important of these fault zones is the Main Sayan Fault, an active sinistral strike slip fault that marks the boundary between the rigid Siberian craton and the intracontinental Sayan Mountains. Associated with the Main Sayan Fault, the Tunka fault represents another active sinistral strike slip fault. Along both faults a series of sedimentary basins connect the South Baikal Basin with the Hubsugul Basin in northern Mongolia. These basins are from east to west the Bistraya Basin, the Tori Basin, the Tunka Basin, the Turan Basin, the Khoitogol Basin and the Mondy Basin. The Tunka Basin is by far the largest and most striking of these basins. Together these basins form a marked intramontane depression between the east-west trending ranges of the Sayan Mountains, in particular between the Tunka Range (north) and the Khamar-Daban range (south).

During the Mesozoic the area experiences a large-scale compressive, orogenic event, the Mongol-Okhotsk orogeny, associated with the collision of North China – Mongolia with the North Eurasian (Siberian) continent. Further south, in Mongolia, the Mesozoic is also characterised by widespread extension. In the Oligocene ($\sim$35 Ma),

up to the present, the BRZ experienced a renewed phase of tectonic activity. The reactivation is related to distant tectonic effects of the India-Eurasia collision. The active rifting of the BRZ, the fault movements along the Main Sayan and Tunka faults, and the Cenozoic subsidence and sedimentation in the Tunka basin are all expressions of this neotectonic activity.

In order to constrain the regional Meso-Cenozoic thermo-tectonic history, several areas within the BRZ, the Sayan Mountains and the Tuva-Mongolia microplate have been sampled for geochronologic and thermochronologic investigations. The work presented here represents the preliminary results of an apatite fission-track (AFT) analysis of the Tunka Range, along with reference samples from the South Primorsky Range (Listvyanka area) of the BRZ. All samples (gneiss and granitoid rocks) were collected within the Late Proterozoic – Early Paleozoic crystalline basement of this area. In particular, near the village of Arshan, a vertical profile of 1 km (samples between 1000m and 2000m elevation) was sampled in the Tunka Range. Preliminary results indicate an Early Cenozoic ($\sim$50 Ma) apparent AFT age for the Tunka Range samples. In a next stage, AFT lengths will be measured in order to be able to perform AFT thermal history modelling. An overview of AFT age and length data, along with possible thermal history models will be presented and be used to constrain the regional Meso-Cenozoic thermo-tectonic history in the framework of Mongol-Okhotsk and BRZ tectonics.