



Palaeozoic emplacement and Meso-Cenozoic reactivation of the southern Kazakhstan granitoid basement

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The Central Asian Orogenic Belt (CAOB) represents the world's largest accretionary orogen, pinched between the Tarim block on its southern border, the Kazakhstan block in the NW and the Siberian craton in the NE. Its basement records an amalgamation of various tectonic units which were assembled during several Palaeozoic accretion-collision events. By the Permian, the accretionary tectonics in the CAOB culminated as all major composing units were joined. Late- and post- orogenic deformation and magmatism further shaped the CAOB basement architecture. After final construction in the Late Paleozoic, the CAOB was subjected to several phases of Mesozoic deformation and was again reactivated in the Late Cenozoic as distant effect of the India-Eurasia collision. The Meso-Cenozoic reactivation episodes occurred in an intracontinental setting, as far-field effects of deformation at the (Eur)Asian margins. Hence, as a consequence of the large-scale reactivation of Palaeozoic basement structures, intracontinental orogens were built superimposed on the CAOB basement structure. The basement blocks of southern Kazakhstan hold a key position and several profiles across these units were sampled for this study. The focus was directed to the granitoid blocks surrounding the Kazakh Ili-Balkash Basin, in both the Junggarian and Tien Shan ranges. Late Palaeozoic granites were sampled for zircon U/Pb dating (LA-ICP-MS), mainly yielding Permian ages ranging between 296 ± 5 Ma and 258 ± 5 Ma. These record the final amalgamation of the ancestral CAOB. Knowledge of the reactivation chronology in the CAOB holds key information toward understanding the timing of accretion events at the Eurasian margins. Therefore these granitoids were also analysed using AFT thermochronology to elucidate the more recent events affecting the basement. AFT dating and thermochronological modelling reveal several distinct reactivation events in the Jurassic, Cretaceous and Cenozoic. These are related to the continued accretion of units to the southern active margin of the growing Asian continent. More specifically the accretion of Cimmerian units such as Lhasa in the Mesozoic led to the growth of several mountain ranges in southern Kazakhstan, leading to denudation of the (Late) Palaeozoic basement, and to sediment supply into the adjoining basins such as Ili-Balkash. A subsequent detrital thermochronology study on these sediments, with focus on provenance analysis is underway.