# Continental thickening vs. flat subduction – the cause for Cretaceous magmatism in the Pamir

N. MALZ*[1], J. A. PFÄNDER[1], L. RATSCHBACHER[1], C. MÜNKER[2], K. MEZGER[3], S. JUNG[4], D. GARBE-SCHÖNBERG[5] AND F. HAUFF[6]

[1]Institut für Geologie, TU Bergakademie Freiberg, Germany (*correspondence: malz@geo.tu-freiberg.de)
[2]Institut für Geologie und Mineralogie, Universität zu Köln, Germany
[3]Institut für Geologie, Universität Bern, Switzerland
[4]Mineralogisch-Petrographisches Institut, Universität Hamburg, Germany
[5]Institut für Geowissenschaften, Universität Kiel, Germany
[6]GEOMAR, Helmholtz-Zentrum für Ozeanforschung Kiel, Germany

The Pamir Mountains mark the western continuation of the Tibetan Plateau and formed in response to the India-Asia collision, which started about 55 Ma ago. Little is known about the timing and processes that led to the extensive pre-collisional Cretaceous magmatism in the Pamir >500 km away from the closest plate boundary at the time.

In the Central and Southern Pamir, Cretaceous magmatism occurred at two distinct episodes with peaks at ca. 108 and 82 Ma. We studied 40 monzogranites and granodiorites covering both peaks that are metaluminous to peraluminous with trace element characteristics pointing to bt-dehydration melting processes. The initial Sr-, Nd- and Hf-isotope ratios are very hetereogenous with $^{87}Sr/^{86}Sr_i$, $\varepsilon Nd_i$ and $\varepsilon Hf_i$ ranging from 0.7024 to 0.7308, from -12.8 to -2.2, and from -15.2 to +5.4, respectively. This large variation indicates that the granitic melts contain variable amounts of mantle derived material added to the crustal melts or increasing AFC processes involving ancient crust in mantle-derived melts.

The temporal gap of Cretaceous magmatism correlates with the collision of the Kohistan arc and the Karakoram terrane between 100 and 85 Ma [1, 2]. We hypothesize that the Mid-Cretaceous magmatic pulse is related to flat-slab subduction of the Neo-Tethys that terminated due to slab-rollback or break-off, whereas Late-Cretaceous magmatism is triggered by crustal thickening and melting as a far-field effect following collision. To test this hypothesis we currently investigate the age and isotopic variation of felsic magmatism across strike from the Kohistan-Ladakh arc in the south to the Central Pamir in the north.

[1] Treolar et al. 1989, *Tectonics* **8** [2] Treloar et al.1996, *J. Geol. Soc. Lond.* **153**