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Redefining the Trans-Himalayan Batholith in the frame of the India-Eurasia collision

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The Himalayan belt as well as the paleo-Eurasian margin show structural and lithological lateral continuities that host the key to our understanding of the India-Eurasia collision. On the western end of the orogen these continuities are perturbed by the presence of the Kohistan Ladakh paleo-island arc (KLA) that was part of an intra-oceanic island arc chain offshore of the Eurasian margin within the neo-Tethys. The KLA is now wedged between India and Karakoram with the Shyok suture separating the KLA in the north from the Karakoram, whereas in the south the Indus suture isolates the KLA from the Indian continent. The middle to upper crustal portion of the KLA is characterized by granitoids that defines the KLA Batholith. The KLA Batholith is often accepted to represent the western termination of the trans-Himalayan Batholith, the lateral continuation of the Gangdese Batholith defining the southern edge of the Lhasa block. Here we present the compilation of geochemical and geochronological data on the different batholiths, and call for a reassessment of the interpretation of the Trans-Himalayan granitic belt. The evolution of the trace elements and isotopic signatures of the granitoids that form the different batholiths clearly demonstrates that the KLA Batholith was not part of the Eurasian margin, and should not be identified as being part of the Trans-Himalayan Batholith. Together with the recent informations on suture formation, defining the Shyok-Tsangpo suture as the locus of collision at 40 Ma, as well as the geochemical evolution of the Shyok-Tsangpo suture zone units, the data allow reinterpreting the lateral continuities of the lithologies along the Himalayan belt and shade light on the India-Eurasia collision.