

# Miocene leucogranite and porphyritic granitoid from Pangong Metamorphic Complex, eastern Ladakh Trans-Himalaya, India: Evidence of synchronous melting and formation of granitoid pluton

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The Pangong metamorphic complex (PMC) is the central part of dextral strike-slip Karakoram fault that demarcates the eastern boundary of the Karakoram terrane, trending N 40°W. It is bounded by two sets of high strain mylonitic fault strands. The Tangste fault strand, separates the SW low strain zone of porphyritic granitoids from the PMC to the NE that delineate to the north by the Pangong fault strand. The PMC is mainly comprised the amphibolite, granulite, calc-alkaline granitoids, calc-silicate, and migmatite, which are cross cut by the leucogranite and pegmatite in a network style. A porphyritic (K-feldspar megacrysts bearing) granitoid pluton is associated with the PMC. Thin layers of leucogranitic melt parallel to the foliation underwent tight isoclinal folding along with the host rocks, representing the in situ and syn-kinematic nature of melt generation. Some discordant leucocratic melts with the mesocratic, melanocratic migmatite point towards the post-deformational injection. These features strongly indicate the pulsative nature of leucocratic melt generation and/or magmatic differential processes or leucocratic melts originated at different depths or differential melting degrees of a source. A melanosome granulite from Tangtse region consisting of cpx-scapolite-pl±qtz±ep±tn assemblage typically representing the granulose texture. Mesosome, corresponding to the amphibolite facies, bears hbl (±cpx)-bt-pl-qtz assemblage with predominant hornblende. Leucosome, representing a typical leucogranite melt, exhibits hypidiomorphic texture having bt-Kf-qtz and occasional residual plagioclase with inclusions of quartz blebs as partial melts. Inherited zircon cores from leucogranite melt (N=15) yielded an older weighted mean <sup>206</sup>Pb/<sup>238</sup>U age of 72.1±1.9 Ma (MSWD=2.0), whereas zircon growth rims over the inherited cores provided younger weighted mean <sup>206</sup>Pb/<sup>238</sup>U age of 18.24±0.29 Ma (MSWD=3.0) as crystallization age of zircons in the leucogranite melt. Zircons from a porphyritic granitoid yielded weighted mean <sup>206</sup>Pb/<sup>238</sup>U zircon crystallization age of 18.96±0.23 Ma (MSWD = 3.2) with zircon εHf<sup>t</sup> values ranging between +7.4 to -10.3 which, in view of the errors associated with the ages, is coeval and synchronous with those of the