# Late Mesozoic magmatism in Shiquanhe area, southwestern Tibet: Evidence of slab break-off of Bangong-Nujiang Ocean

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Mesozoic magmatism provides a prime opportunity to understand geological evolution of Lhasa terrane, southern Tibet. Here we present zircon U-Pb dating, in situ Hf isotopic analysis, and high precision whole-rock Mg isotopic study on the late-Jurassic to early Cretaceous (~142 Ma and ~155 Ma) granitoids in Jiangba and Bangba plutons, which are located in the south of the Bangong-Nujiang Suture Zone, southwestern Tibet. The 155 Ma granodiorites from Jiangba pluton, which occupies an area of over 1000km$^2$, share similar zircon Hf isotopic compositions with their dioritic enclaves ($SiO_2$=52.5-62.3%; $\varepsilon_{Hf}(t)$ = -11.8 to 1.8), suggesting that they are most likely originated from magma mixing between mantle-derived and ancient crust-derived melts. By contrast, the ~142 Ma gabbroic enclaves and their host granitoids ($SiO_2$=50.9-74.0%) from Bangba pluton exhibit overall positive zircon $\varepsilon_{Hf}(t)$ (-1.0 to +14.4), which can be interpreted as reflecting the dominant roles of juvenile lower crust and depleted lithospheric mantle in their source regions. The Mg isotopic compositions of dioritic and gabbroic enclaves and their host granitoids exhibit similar $\delta^{26}$Mg values ranging from -0.52 to -0.01, mostly between -0.18 to -0.40 (average value of -0.26). This finding further confirms that Mg isotope fractionation during granite differentiation is negligible. Hence, the average $\delta^{26}$Mg of -0.26 (2SD) of granitoids from this study can be considered as the average Mg isotopic composition of the continental crust in the central Lhasa terrane. Based on the data in this study and other literatures, we propose that a significant change of tectonic settings may have recorded by the ~155 Ma and ~142 Ma magmatisms in Shiquanhe region, in which the latter (~142 Ma) possibly induced by the slab break-off of the subducted Bangong-Nujiang oceanic crust.