Episodic delamination of impacting lithospheric wedge (ILW) and uplift of Tibetan plateau

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Different models have been suggested for the formation of collisional plateau such as the Tibetan Plateau. Impacting lithospheric wedge (ILW) hypothesis (Shi et al., 2015) was proposed recently to interpret the temporal-spatial distribution and origin of Paleogene granitoids along Gaoligong, Lancangjiang, and Ailaoshan-Red River fault systems in Western Yunnan, China, which is an important region in the southeastern Tibetan syntaxis for understanding mountain-building processes and collisional tectonics. Subsequent continental lithospheric delamination would cause uplift and emplacement of volcanic rocks.

Potassic igneous rocks are widely distributed in Tibetan plateau and surrounding areas, which are thought to be coincident with rapid uplift of Tibetan plateau (Turner et al., 1996; Chung et al., 1998) and represent the derivation from the lithospheric mantle (Turner et al., 1993). The available geochronological data of potassic igneous rocks in Tibetan plateau and surrounding areas are systemically analyzed to show episodic characteristics (ca. 41-32 Myr, 19-10 Myr, and 4-0 Myr), which are coincident with rapid uplift of the Tibetan plateau. Golmud-Gala seismic tomography across the Tibetan plateau (Xu et al., 2004) indicates three large vertical high-velocity anomalous bodies beneath the Tibetan plateau, which we suggest they were derived from three delaminations of impacting lithospheric wedge have took place during the past 41 Myr.

References

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