

## **Reconstructing Crustal Thickness Evolution from Eu Anomalies in Detrital Zircons**

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Here we calibrate a crustal thickness proxy based on Eu anomalies in zircons. We show that, in felsic rocks, zircon  $\text{Eu}/\text{Eu}^*$  (chondrite normalized  $\text{Eu}/\sqrt{(\text{Sm} \cdot \text{Gd})}$ ) correlates with whole-rock  $\text{La}/\text{Yb}$ , which in turn can be used to infer crustal thickness. The resultant positive correlation between zircon  $\text{Eu}/\text{Eu}^*$  and crustal thickness can be explained by two processes happening at high pressure: (1) depression of plagioclase and (2) endogenic oxidation of  $\text{Eu}^{2+}$  due to garnet fractionation. The  $\text{Eu}/\text{Eu}^*$ -in-zircon proxy for crustal thickness makes it possible to reconstruct crustal thickness evolution in magmatic arcs/orogens using detrital zircons. We then applied our  $\text{Eu}/\text{Eu}^*$ -in-zircon crustal thickness proxy to southern Tibet. We measured the detrital zircons separated from modern river sands in the Gangdese belt, southern Tibet. Our results reveal a major crustal thickening trend since the Eocene, and possibly an earlier thickening process in the late Cretaceous. These findings are consistent with field observations of contractional deformations of sedimentary strata in southern Tibet.