# The Upper Crustal Shortening of the Southern Tibetan Plateau Before and During the Indo-Asian Collision

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Most people agree that the highest and biggest plateau in the world, the Tibetan plateau, was created by the Indo-Asian collision alone. However, the Tibetan plateau was shortened both before and during the Indo-Asian collision.

The mapping work in the Linzhou basin, 30 km north of Lhasa, shows that the Tertiary Linzizong formation, which is mainly composed of intermediate-felsic volcanic rocks, unconformably overlay the Cretaceous Takena formation. In addition, the early Tertiary unconformity is cut by two young thrust faults, and covers an old thrust fault which throws the JK on the Cretaceous. One of the two young thrust faults throws the Jurassic on the Tertiary, and the other throws the Triassic on the Jurassic. Moreover, the latter is also intruded by a younger granite pluton.

The three thrust faults, both older and younger than the ealry Tertiary unconformity, indicate that there are upper crustal shortening both before and during the Indo-Asian collision. The balanced section, and the ages of the granite pluton mentioned above and the dikes which cut through the Late Cretaceous and the Tertiary, constrain the accurate magnitude and exact ages of the shortening. The upper crustal shortening occurring before the Indo-Asian collision indicates that the Southern Tibet did uplift at that time. During the Indo-Asian collision, the uplifting was further strengthened. Based on the work in the Linzhou basin, combined with the work of Mike Murphy in the Coqing area, it is concluded that the high Southern Tibet, even probably the whole Tibetan plateau, was created by both the Indo-Asian collision and at least one previous tectonic case, that is possibly the Lhasa-Qiangtang collision.