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Himalaya ultrahigh pressure evolution and warped Indian subduction plane

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On both sides of the Western Himalayan Syntaxis, P-T-t data on ultrahigh-pressure metamorphic rocks suggest that the western Kaghan unit was metamorphosed under UHP conditions significantly later ($\sim$ 46 Ma) than the Tso Morari unit ($\sim$ 54 Ma). This suggests that the Kaghan unit was originally located in a more internal part of the Indian plate, compared with the Tso Morari. By using the amount of Indian plate subduction from 55 Ma to 40 Ma in conjonction with the P-t evolution of the UHP units, we calculate the dip of subduction. We estimate that during burial of both units, the dip of the subduction plane was relatively high (30-40°), on both sides of the Western Syntaxis, indeed much higher than previously estimated. During their exhumation, the dip of the subduction plane in the Kaghan region remained high whereas, in the eastern part, it decreased to about 9° as observed today. The evolution of the subduction angles allows to constraint the evolution of the initial geometry of the continental collision zone. The Tso Morari unit, on the eastern side of the Western Syntaxis, recorded a flattening of the subduction dip between 55Ma and 47Ma, which probably corresponds to flattening of the buoyant continental Indian plate beneath Southern Tibet. On the western side, the Kaghan unit recorded a constantly steep angle of subduction. The Kaghan unit recorded the initiation of the formation of the Western Syntaxis, around 50Ma, pinched towards the west along the proto-Chaman fault, as present-day observed. The current difference in continental subduction on both sides of the Western Syntaxis seems inherited from the early continental subduction period. Using

tomographic images, it is possible to image the subduction slab during its burial. Correlation of tomography and tectonic reconstructions allow to estimated the ages of the tomographic images of the slab, and to locate the positions of the UHP units on them.