Geodynamics of Chamba Nappe, western Himalaya

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Chamba Nappe is a SW-directed thrust sheet, which is composed of the Tethyan Sequence and was exhumed by thrusting along the Chamba thrust that is equivalent to the Panjal Thrust or the Main Central Thrust (MCT) over the Lesser Himalaya Sequence. Internal deformation within Chamba nappe is responsible for a large amount of crustal thickening and shortening (Sharma and Bhola 2004). The Chamba nappe is folded by regional scale fold *viz* the Chamba-Bharmaur syncline, Tandi syncline and Tisa anticline (Frank 1995, Sharma et al. 2003, Thakur 1998) and is the result of southwestward propagation of cover rocks on their basement (HHC) due to topographic uplift. The southward propagating thrust system also led to the development of major folds DF_1, DF_2 and minor DF_3 folds in a single progressive deformation.

DF_1 is the main compression phase, which corresponds to early SW-directed movements associated with the formation of the Chamba Nappe. Deformation associated with DF_2 phase propagated gradually from the Indus Suture Zone towards the SW as the Indian plate was progressively subducted below Asia along the Indus Suture Zone. DF_3 last phase is marked by kink-band formation as a result of brittle deformation in the slate/phyllites sequence due to amplification of Chamba nappe.

These deformations resulted with the southwestward-directed exhumation of the Tethyan Himalayan Sequence over the Higher Himalayan Crystalline. The southwestward propagation of the Chamba Nappe also affected the basal series of the Tethys Himalaya, which will ultimately form the High Himalayan Crystalline Sequence. In initial stage, mainly Proterozoic, basal series were still welded to the Tethys Himalaya, but as deformation proceeded, and as the Tethys Himalaya formed an increasingly thick stack of rocks, the lower part of the Tethys Himalaya became ductile enough to accommodate the compressive deformation through ductile shearing (Robyr et al. 2002). From that time onwards, the compressive forces were essentially concentrated along a ductile shear zone at the base of the Chamba nappe. Movements along Panjal thrust/Chamba thrust (MCT-1) zone contributed to the further underthrusting and metamorphism of the basal proterozoic series, which leads to the ultimate metamorphic differentiation between the Tethys Himalaya and the High Himalayan Crystalline Sequence.

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