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CONSTRAINING THE EVOLUTION OF HT SHEAR ZONES IN THE HIMALAYAN MID CRUST: FUSING STRUCTURAL GEOLOGY AND PETROCHRONOLOGY

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The mid-crust of the Himalaya is represented by the Greater Himalayan Sequence (GHS), one of the major tectonic units of the Himalayan belt exposed for nearly ~ 2500 km. It has been considered as a coherent tectonic unit since long time, bounded by the South Tibetan Detachment to the top and the Main Central Thrust to the bottom. However, a multidisciplinary approach including structural analysis joined to petrology and petrochronology allowed to recognise several high-temperature shear zones in the core of the GHS along the belt, with top-to-the S/SW sense of shear (High Himalayan Discontinuity: HHD). This tectonic feature running for several hundreds kilometres is documented in several sections of Western and Central-Eastern Nepal dividing the GHS in two different portions. We present also new results of a structural and geochronological transect in the GHS of Marsyangdi valley (Manaslu-Annapurna massifs, Central Nepal). *In situ* U-Th-Pb analysis of monazite constrains the timing of top-to-the S/SW shearing between ~ 28 Ma and 17 Ma during the retrograde path of the hanging wall rocks in the sillimanite stability field.
The long lasting activity of the HHD under medium to high-grade metamorphic conditions controlled the P-T-t paths of the hanging wall and footwall rocks at the point that they recorded maximum P-T conditions at different times. Earlier exhumation of the hanging wall was triggered by the contractional kinematics of shear zone, whereas in the same time span the footwall underwent increasing P-T conditions.
The similarity in timing of movement of this shear zone and the later Main Central Thrust (< 17/16 Ma), from deeper to upper structural levels, fits with an in-sequence shearing tectonic model for the exhumation of the Himalayan mid crust.