

Meso-Scopic Structural Analysis of Chaura Thrust, Himachal Pradesh, India

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Abstract : Jhakri Thrust (JT) coeval of Sarahan Thrust (ST) was later considered to be part of Chaura Thrust (CT). The Main Central Thrust (MCT) delimits the southern extreme of Higher Himalaya, whereas the northern boundary defines by South Tibetan Detachment System (STDS). STDS is parallel set of north dipping extensional faults. The activation timing of MCT and STDS. MCT activated in two parts (MCT-L during 15- 0.7 Ma, and MCT-U during 25-14 Ma). Similarly, STDS triggered in two parts (STDS-L during 24-12 Ma, and STDS-U during 19-14 Ma). The activation ages for MBT and MFT. Besides, the MBT occurred during 11-9 Ma, and MFT followed as <2.5 Ma. There are two mylonitised zones (zone of S-C fabric) found under the microscope. Dynamic and bulging recrystallization and sub-grain formation was documented under the optical microscope from samples collected from these zones. The varieties of crenulated schistosity are shown in photomicrographs. In a rare and uncommon case, crenulation cleavage and sigmoid Muscovite were found together side-by-side. Recrystallized quartzofeldspathic grains exist in between crenulation cleavages. These thin-section studies allow three possible hypotheses for such variations in crenulation cleavages. S/SE verging meso- and micro-scale box folds around Chaura might be a manifestation of some structural upliftment. Near Chaura, kink folds are visible. Prominent asymmetric shear sense indicators in augen mylonite are missing in meso-scale but dominantly present under the microscope. The main foliation became steepest (range of dip ~ 65 - 80 °) at this place. The aim of this section is to characterize the box fold and its signature in the regional geology of Himachal Himalaya. Grain Boundary Migration (GBM) associated temperature range (400-750 °C) from microstructural studies in grain scale along Jhakri-Wangtu transect documented. Oriented samples were collected from the Jhakri-Chaura transect at a regular interval of ~ 1km for strain analysis. The Higher Himalayan Out-of-Sequence Thrust (OOST) in Himachal Pradesh is documented a decade ago. The OOST in other parts of the Himalayas is represented as a line in between MCTL and MCTU. But In Himachal Pradesh area, OOST activated the MCTL as well as in between a zone located south of MCTU. The expectations for strain variation near the OOST are very obvious. But multiple sets of OOSTs may produce a zigzag pattern of strain accumulation for this area and figure out the overprinting structures for multiple sets of OOSTs.

Keywords : Chaura Thrust, out-of-sequence thrust, Main Central Thrust, Sarahan Thrust

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