

A study on Structural analysis of Out-of-Sequence Thrust along Sutlej River Valley (Jhakri-Wangtu section) Himachal Pradesh Higher Himalaya, India

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Abstract : The Sutlej River Valley in Himachal Pradesh, India, is home to four Out-of-Sequence Thrusts (OOST) in the Higher Himalaya. These OOSTs include Jhakri Thrust (JT), Sarahan Thrust (ST), Chaura Thrust (CT), and Jeori Dislocation (JD). The study focuses on the rock types of these OOSTs, including ductile sheared gneisses and upper greenschist-amphibolite facies metamorphosed schists. Microstructural tests reveal a progressive increase in strain approaching the Jakhri thrust zone, with temperatures increasing from 400 to 750°C. The Chaura Thrust is assumed to be folded with this anticlinorium, with various branches that make up the thrust system. Fieldwork and microstructural research have revealed the following: (a) initial top-to-SW sense of ductile shearing (Chaura thrust); (b) brittle-ductile extension (Jeori Dislocation); and (c) uniform top-to-SW sense of brittle shearing (Jhakri thrust). Samples of Rampur Quartzite from the Rampur Group of Lesser Himalayan Crystalline and schistose rock from the Jutogh Group of Greater Himalayan Crystalline were examined. The study emphasizes the value of microscopic research in detecting different types of crenulated schistosity and documenting mylonitized zones. The paper explains the field evidence for the OOST and comes to the conclusion that the Chaura Thrust is not a blind thrust. The paper describes the box fold and its characteristics in the Himachal Himalayan regional geology.

Keywords : Out-of-sequence thrust (OOST), jakhri thrust (JT), sarahan thrust (ST), chaura thrust (CT), jeori dislocation (JD)

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