AOGS 2005

Late-Quaternary deformation partitioning and evolution of Dun structure in the mountain front of NW Himalaya

ANAND K. PANDEY[1*], V.C. THAKUR[2] and PRABHA PANDEY[3]

[1] *National Geophysical Research Institute, Hyderabad – 500007*
[2] *Wadia Institute of Himalayan Geology, Dehradun – 248 001*
[3] *Department of Geology, Banaras Hindu University, Varanasi-221005*

In the foreland-propagating fold-thrust belt of Himalaya the Main Boundary Thrust (MBT) and Himalayan Frontal Thrust (HFT) constitute the neotectonically and seismically active deformation front. The exhumation of frontal Siwalik belt along the HFT led to the formation of Dun structures in the Himalayan front within the MBT-HFT wedge. This tectonic wedge is undergoing active deformation that led to the growth of a series of out-of-sequence faults and associated structures. These intra-wedge faults partition the deformation coaxial to the NW-SE compressional regime of Himalaya with synthetic (top-to-south) and antithetic (top-to-north) back-thrust/fault. This front parallel deformation show lateral variability in the shortening, which may be the result of existing basement fault or it might be responsible for the growth of transverse faults in the region. There are strong geomorphic indications that the deformation front is progressing further south of HFT zone in the form of Piedmont Fault.

These active structures in the Himalayan mountain front are observed in the form of Late-Quaternary geomorphic, structural and stratigraphic expressions in Duns and Piedmont zones of NW Himalaya. These structures have grown subsequent to 0.5 Ma years with peak activity postdates ~100 Ka and the youngest deformation is as young as <5 Ka. The complete tectonic scenario has been analyzed to delineate the sequential evolution of these structures during post-100Ka period (Late Quaternary – Holocene) in the range front of NW Himalaya.

Keywords: Himalayan front; Deformation; Dun structure; Late-Quaternary; MBT-HFT wedge.