



## **Investigating the Piedmont fault to the south of Himalayan front - evidences of its existence and absence along the Himalaya**

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Since the formation of the Himalaya, its mountain front is migrating southward. The mountain front has successively migrated from the Main Central Thrust (MCT) to the Main Boundary Thrust (MBT) and finally to the Main Frontal Thrust (MFT; also called as Himalayan Frontal Thrust or HFT) in the south. It has been suggested in the past that the MFT accommodates nearly half of the convergence between the Indian and Eurasian plates; but, GPS measurements show no convergence across MFT. A recent study by Yeats and Thakur (2008) identified a new mountain front - which they termed 'Piedmont fault' - to the south of the MFT; they extended it from the western to the central Himalaya. However, no further study has been ever carried out on this fault.

This study investigates the proposed piedmont fault in the northwestern and central part of the Himalaya. The results suggest that some of the geomorphic evidence given earlier (Yeats and Thakur, 2008) for the existence of the Piedmont fault in the northwestern Himalaya could be explained merely by incision and shifting of the tributaries in response to the temporal variation (both base level and location) of the trunk river, i.e. Ganga. In fact, it is observed that stronger geomorphic evidence such as drainage reorganisation, the presence of paleochannels and uplifted topography, indicate the presence of the Piedmont fault in the central Himalayan region. The drainage reorganisation has led to a large-scale river planform change in the Ghaghara river (known as Karnali in Nepal) in the Indo-Gangetic plains in the frontal part of the central Himalaya. This study concludes that although there is a development of a new mountain front to the south of the MFT, it is not continuous as suggested earlier. It is also suggested that there is a need for paleoseismic investigations across this fault to understand the stress partitioning in the Himalaya as these faults pose a significant threat to the adjoining parts of the Himalaya.

### References

Yeats, R.S., and Thakur, V.C., (2008), Active faulting south of the Himalayan Front: establishing a new plate boundary. *Tectonophysics* 453; 63-73.