



Neotectonics slip rate at the front of the Qilian Shan, NE Tibetan plateau

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We derive a slip rate for the frontal thrust at the north Qilian Shan (NE Tibet) mountain front by combining structural investigations, satellite imagery, topographic profiling, and ^{10}Be exposure dating. We used two terrace levels, and from each we took 6-7 samples in profiles dug to depths of two meters. These allowed us to constrain inheritance (less than a couple of thousand years, for each) and to yield precise ages of abandonment of the terraces: The higher terrace yields an exposure age of 30.5 kyr; the lower yields 19 kyr. Topographic profiles 3 km in length give us offsets of the terraces with respect to the present-day footwall of 19 and 33 meters. The combination of these two offsets and the two ages allows a calculation of the burial of the footwall, around 4 meters. These data yield a vertical displacement rate of ~ 1.2 mm/yr, twice that of previous studies further northwest (Hetzel et al., 2004). The associated shortening rate due to thrust slip calculated with end member values of the thrust dip (30 to 60 degrees) range between 1.4 and 2.4 mm/yr. Again, this is significantly higher than the results from further northwest (Hetzel et al., 2004). This might be explained by the in-sequence propagation of an active back thrust where Hetzel et al. (2004) obtained their results. At continental scale our results are consistent with GPS studies (e.g. Zhang et al., 2004).

References:

Hetzel, R. et al., *Tectonics* (23), 2004

Zhang, P.-Z. et al., *Geology* (32), 2004