Geophysical Research Abstracts
Vol. 13, EGU2011-4192-1, 2011
EGU General Assembly 2011

Strain partitioning along the Shuilikeng transpressive Fault System (Central Taiwan fold-and-thrust belt)

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The Shuilikeng Fault, in the Central Taiwan fold-and-thrust belt, is a roughly north-south striking zone comprised of a number of high-angle faults and fault splays that juxtaposes the Miocene rocks of the Western Foothills against the Eocene and Oligocene rocks of the Hsuehshan Range. Geomorphologically, it coincides with a pronounced system of valleys that clearly demarcates the contact between these two tectonostratigraphic units in Central Taiwan. Using river incision, channel morphology, and stream gradient along the Wu and Peikang rivers, YANITES et al. (2010) and SUNG et al. (2000) suggest that the Shuilikeng Fault is currently active, and has been throughout the Holocene. However, because of the absence of Pleistocene and Pliocene sediments they are unable to put any constraints on older activity. The Shuilikeng Fault is poorly imaged in reflection seismic data, where it has been interpreted to dip steeply eastward and extend to deep in the middle crust (i.e. the Shuichangliu Fault of WANG et al., 2002). YUE et al. (2005) interpret the Shuilikeng Fault to be the westward-dipping displaced upper part of a pre-existing Miocene-age extensional fault whose lower part, they suggest, coincides with an area of high seismic activity below their detachment. On the basis of new surface geological mapping we suggest that the Shuilikeng Fault, rather than being a single discrete feature, consists of a main fault zone with a linked system of associated faults that affect much of the Hsuehshan Range. All faults (from west to east, Alenkeng Fault, Checheng Fault, Tili Fault) and folds that have been so far mapped in the Hsuehshan Range merge southward with the Shuilikeng Fault, resulting in a regional map pattern that is strongly suggestive of a strike-slip or transpressive fault system. Bending of folds into the Shuilikeng Fault System in, e.g., the Tingkan Syncline and the Tsukeng Anticline, suggests a left lateral (top-to-the-northwest) sense of displacement along it. Focal mechanisms are in keeping with field observations and suggest shallow oblique to strike-slip faulting (e.g., northern sector) and deeper thrust faulting (e.g., southern sector).

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