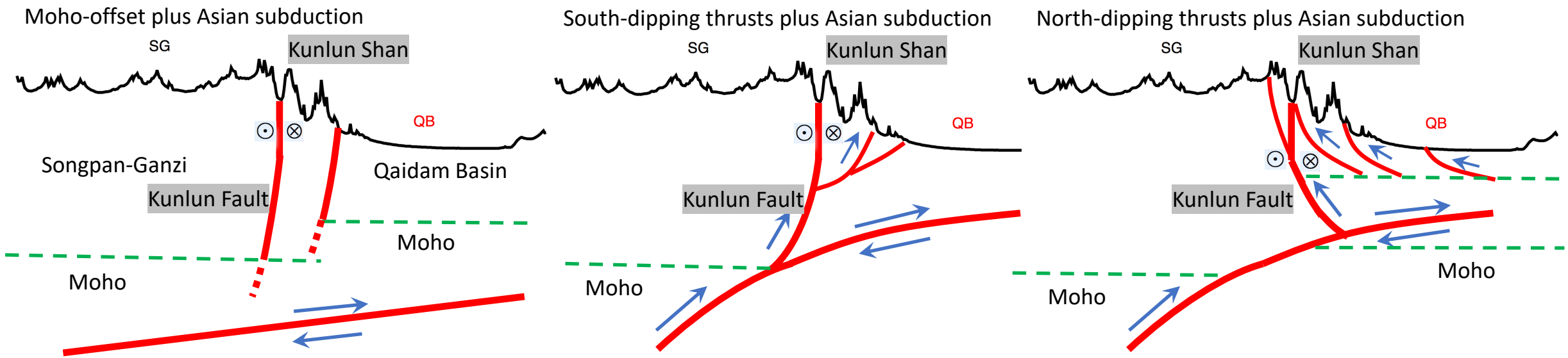
Contemporary uplift at the Kunlun Shan (Mountain), Northern Tibetan Plateau

We use GPS-derived shortening deformation to test different crustal thickening mechanisms for the region across the Kunlun Mountain.



Shaozhuo Liu[1], Jean-Mathieu Nocquet[2-3], Yann Klinger[2], Xiwei Xu[4], Guihua Chen[5], Guihua Yu[5], and Sigurjón Jónsson[1]

[1] King Abdullah University of Science and Technology, Thuwal, Saudi Arabia. [2] Tectonics, Institut de Physique du Globe de Paris–CNRS, Paris, France. [3] Geoazur, IRD, Université Côte d'Azur. [4] Institute of Crustal Dynamics, China Earthquake Administration, Beijing, China. [5] The Key Laboratory of China Earthquake Administration for Active Tectonics and Volcanology, Beijing, China.

7th May, 2020

EGU General Assembly 2020

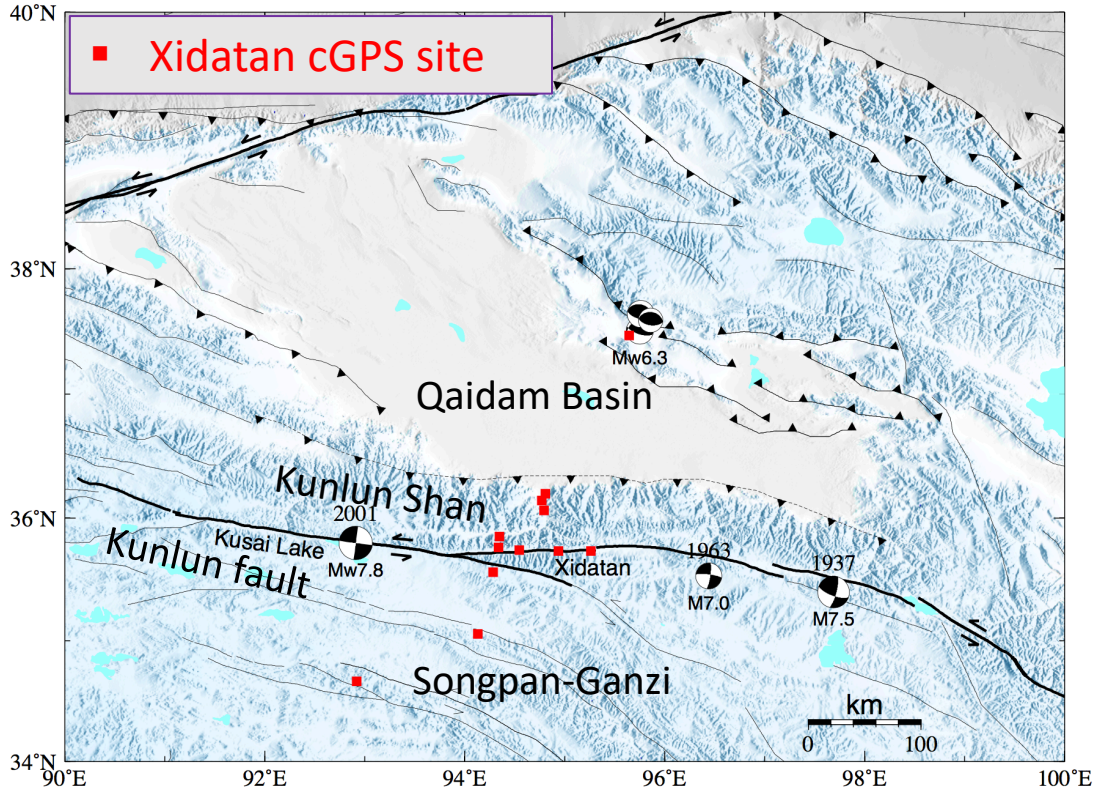
EGU2020-6011

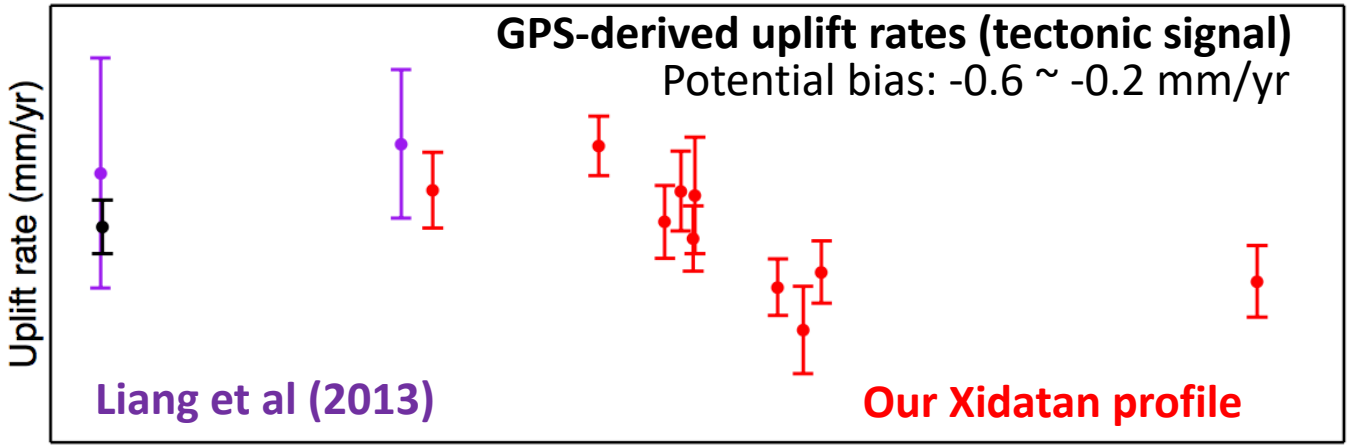
https://doi.org/10.5194/egusphere-egu2020-6011

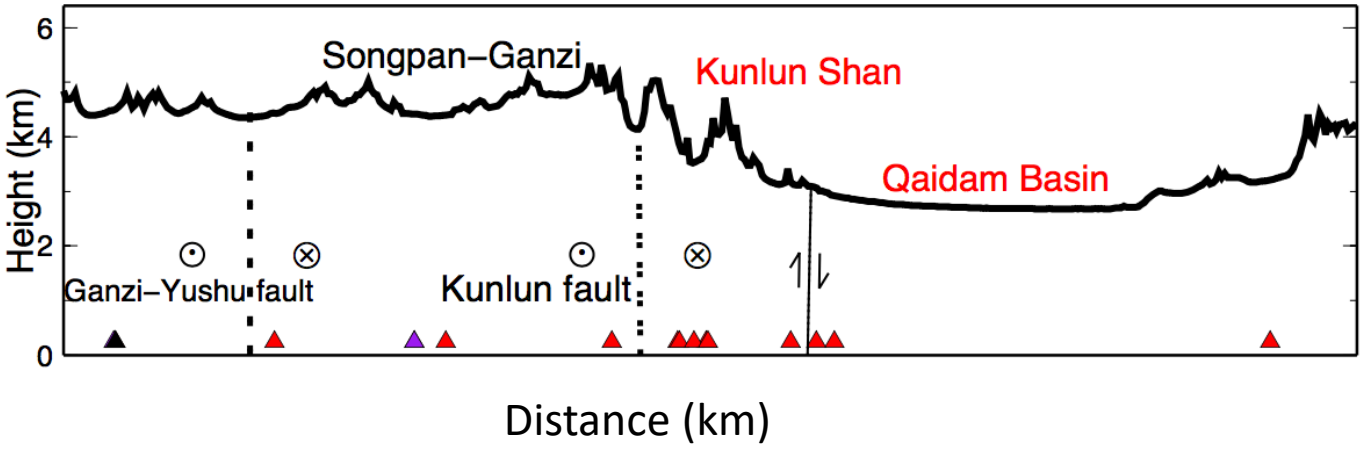
GPS uplift rates

To obtain GPS-derived uplift rates, we assess the following factors:

- Reference frame drift
- Common mode errors
- Hydrological mass load variations
- Glacier retreat
- Postseismic transients
- Time-correlated noise

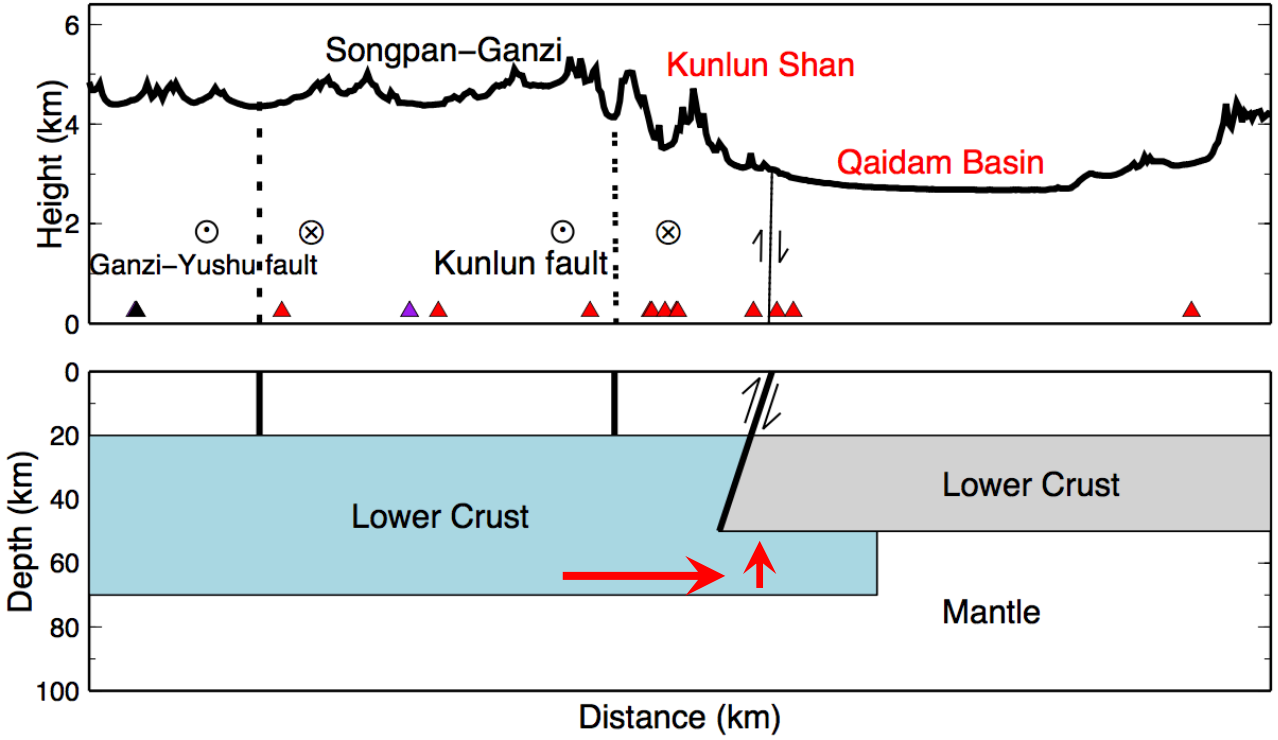


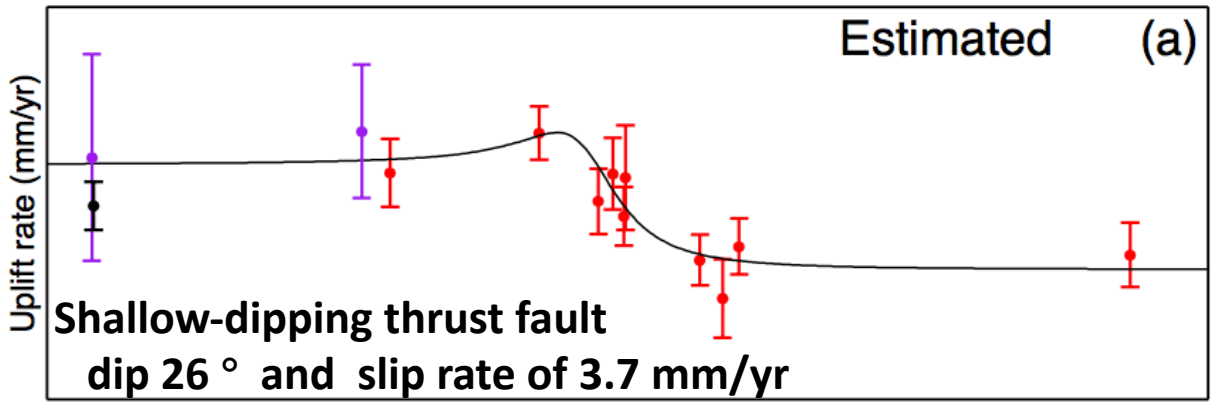


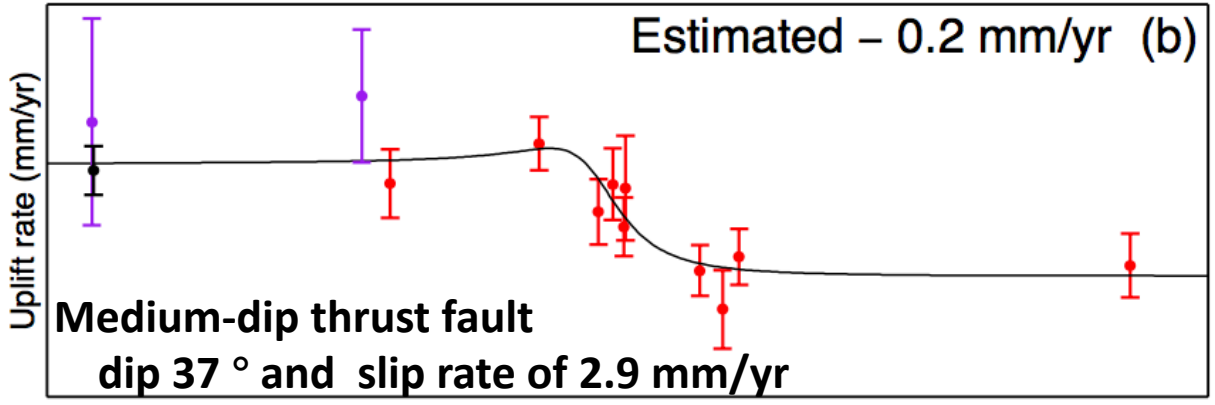


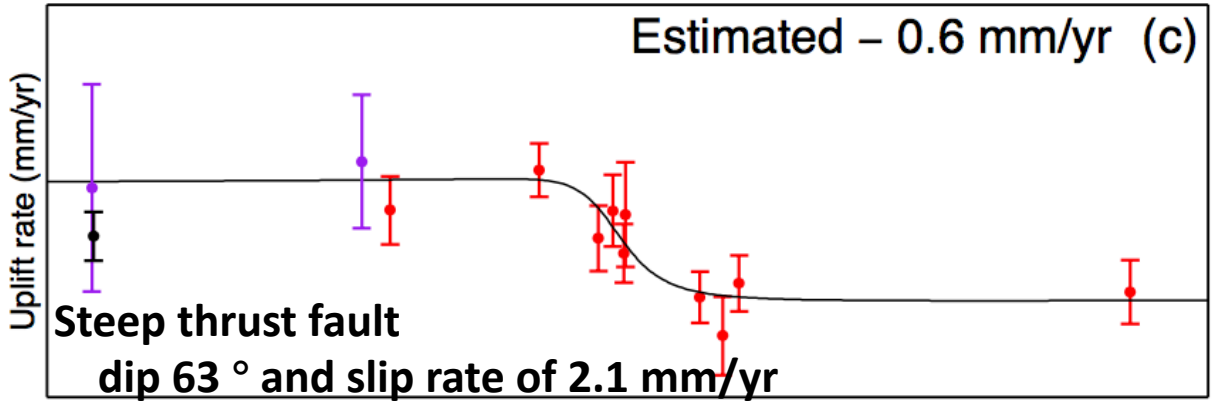
Citation: Liang et al, Three-dimensional velocity field of present-day crustal motion of the Tibetan Plateau derived from GPS measurements, JGR (2013), 118 (10), 5722-5732

Uplift rates and geologic structures









- The steeply dipping thrust fault is unlikely according to Anderson's faulting theory.
- Earlier studies have suggested lower crustal flow as a driving mechanism for steep thrusting and uplift of Kunlun Shan (Karplus et al., 2019).

Citation: Karplus et al, Receiver-function imaging of the lithosphere at the Kunlun-Qaidam boundary, Northeast Tibet, Tectonophysics (2019), 759, 30-43

Conclusions

1) The patterns of GPS-derived uplift rates correlate with the topography.

2) Low- and intermediate-angle south-dipping thrust faults are probably present beneath the southern margin of the Qaidam Basin.

3) Erosion-driven uplift at the piedmont of the Kunlun mountain is unclear. The effects of Cenozoic sedimentation in the Qaidam Basin on the present-day regional uplift remain to be addressed.