

EGU21-9901, updated on 25 Oct 2021

<https://doi.org/10.5194/egusphere-egu21-9901>

EGU General Assembly 2021

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Large recent counterclockwise rotations in the Tajik Basin and implications on the Pamir salient formation

Lin Li^{1,2}, Guillaume Dupont-Nivet^{1,3}, Pierrick Roperch¹, Yani Najman⁴, Mustafa Kaya³, Niels Meijer³, and Jovid Aminov⁵

¹University of Rennes 1, CNRS, Géosciences Rennes-UMR 6118, Rennes, France (li.lin8611@gmail.com)

²Department of Environmental Sciences, Rochester Institute of Technology, Rochester, NY, USA

³Institute of Geosciences, Potsdam University, Potsdam, Germany

⁴Lancaster Environment Centre, Lancaster University, Lancaster, UK

⁵Institute of geology, earthquake engineering and seismology, Academy of Sciences, Dushanbe, Republic of Tajikistan

Contrasting models have been proposed to explain the formation of the Pamir salient: either largely inherited from a Mesozoic arcuate structure or recently formed by Indian northward indentation and possibly related to syn-orogenic lateral extrusion. The vertical-axis counterclockwise rotations observed in the Tajik Basin are key constraints on testing these models, but the timing of these rotations remains hindered by poor age control on the basin sediments. We report a combined analysis of vertical-axis rotation and magnetostratigraphic dating of a long sedimentary section in the eastern Tajik Basin, which yields strong counterclockwise rotations ($\sim 56^\circ$) in early Late Cretaceous to late Miocene strata. This result suggests that rotation in the Tajik Basin occurred after ~ 8 Ma, much later than previously suggested. Combining with a regional compilation of previous paleomagnetic studies as well as structural and GPS constraints including Pamir and Tarim, we explore potential implications on models of the Pamir salient. We infer that after 8 Ma (probably even later), the Pamir (North, Central, and South) began to overthrust west- and northwest-ward, causing counterclockwise rotations in the Tajik Basin. This reconstruction allows for ~ 150 km of post-8 Ma northwestward indentation into the Tajik Basin, in agreement with coeval underthrusting of the Indian mantle lithosphere into Asia.