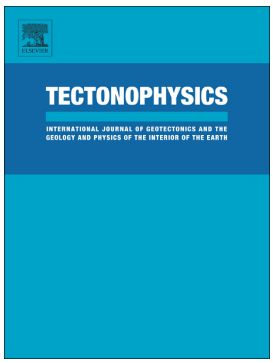

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PII:	S0040-1951(18)30125-2
DOI:	doi:10.1016/j.tecto.2018.03.020
Reference:	TECTO 127810
To appear in:	*Tectonophysics*
Received date:	9 June 2017
Revised date:	22 March 2018
Accepted date:	26 March 2018

Please cite this article as: Laura C. Gregory, Conall Mac Niocaill, Richard T. Walker, Gantulga Bayasgalan, Tim J. Craig , Vertical axis rotation (or lack thereof) of the eastern Mongolian Altay Mountains: Implications for far-field transpressional mountain building. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Tecto(2017), doi:10.1016/j.tecto.2018.03.020

Vertical axis rotation (or lack thereof) of the eastern Mongolian Altay Mountains: implications for far-field transpressional mountain building

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Abstract

The Altay Mountains of Western Mongolia accommodate 10-20% of the current shortening of the India-Asia collision in a transpressive regime. Kinematic models of the Altay require faults to rotate anticlockwise about a vertical axis in order to accommodate compressional deformation on the major strike slip faults that cross the region. Such rotations should be detectable by palaeomagnetic data. Previous estimates from the one existing palaeomagnetic study from the Altay, on Oligocene and younger sediments from the Chuya Basin in the Siberian Altay, indicate that at least some parts of the Altay have experienced up to 39 ± 8° of anticlockwise rotation. Here, we present new palaeomagnetic results from samples collected in Cretaceous and younger sediments in the Zereg Basin along the Har-Us-Nuur fault in the eastern Altay Mountains, Mongolia. Our new palaeomagnetic results from the Zereg Basin provide reliable declinations, with palaeomagnetic directions from 10 sites that pass a fold test and include magnetic reversals. The declinations are not significantly rotated with respect to the directions expected from Cretaceous and younger virtual geomagnetic poles, suggesting that faults in the eastern Altay have not experienced a large degree of vertical axis rotation and cannot have rotated more than 7˚ in the past 5 m.y. The lack of rotation along the Har-Us-Nuur fault combined with a large amount of rotation in the