

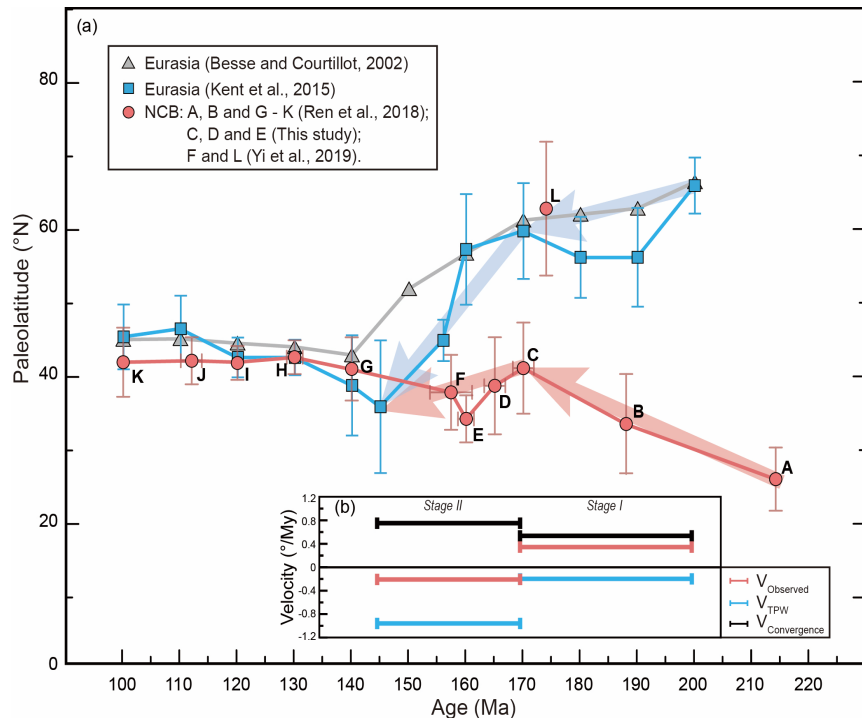
# Enigma of the Jurassic monster shift of the North China block

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A recent study (Yi et al., 2019) placed the north China block (NCB) in very high latitudinal region at ~174 Ma and suggested that the NCB drifted southward quickly thereafter due to the Jurassic TPW. As NCB was located far from the rotation axis of the Jurassic TPW (see Figure in right side) and the plate convergence between Siberia and NCB, known as the subduction in the Mongol-Okhotsk ocean (MOO), did exist. Paleolatitudinal changes observed of the eastern Asian blocks in Jurassic thus should contain the TPW component and plate convergence component. Here we tell a totally different story.



Three new paleomagnetic poles were obtained from the Jurassic volcanic strata in north China that were dated at 170, 165 and 160 Ma (U-Pb Zircon, ICP MS), the reference point paleolatitudes derived from which are labeled **C**, **D**, **E**, respectively, on the red curve in the left figure. Point **F** was calculated from the key pole of Tiaojishan Fm, ~157 Ma.

Our results indicate that the NCB accreted onto the stable Eurasia between ~140 and 150 Ma. Paleolatitude gap between the NCB and Eurasia had been significant but narrowing from 200 Ma to 150 Ma. We recognized two stages for the convergence. In the first stage, between 200 and 170 Ma, a TPW component was estimated at 0.2°/Ma southward and paleolatitudinal drift at 0.34°/Ma northward, the convergence rate was thus estimated at 0.54°/Ma. In the second stage between 170 and 145 Ma, a TPW component was estimated at 0.95°/Ma southward and paleolatitudinal drift at 0.2°/Ma southward, the convergence rate was estimated at 0.75°/Ma. We estimate that there had been at least ~4000 km oceanic crust subducted northward beneath the Siberia continent. Subduction associated volcanic rocks in the southern margin of the Siberia do support our interpretations.

In contrast, the paleomagnetic results from the Nandaling Fm (~174 Ma, Yi et al. 2019) indicate that the NCC had already accreted onto the Eurasia (point **L** in the left Figure). That cannot explain the significant paleolatitude gap between the two in Late Jurassic, unless an ocean reopened or that the paleomagnetic data of **C**, **D**, **E**, **F** are all wrongly interpreted.

Quality of our new data (points **C**, **D** and **E**) were supported by step untilting test, presence of reversals and conglomerate test.

## Reference

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