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## Supplemental Material

**Text S1.** Features of deposits of 60 m to 85 m interval.

**Figure S1.** Stratigraphic thickness and sedimentation accumulation rate plotted versus stratigraphic ages of the Herjia sequence.

**Figure S2.** Grain-size frequency distribution.

## Supplementary Information

### East Asian summer monsoon variations across the Miocene-Pliocene boundary recorded by sediments from the Guide Basin, northeastern Tibetan Plateau

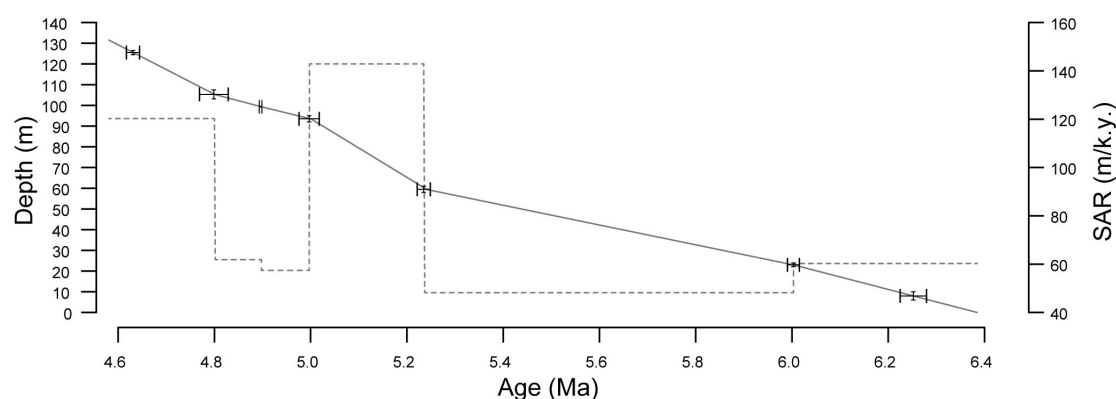
Xingwan Liu <sup>1</sup>, Junsheng Nie <sup>1\*</sup>, Bin Zhou <sup>2</sup>, Zhongbao Zhang <sup>1</sup>

**Text S1:** Features of deposits of 60 m to 85 m interval.

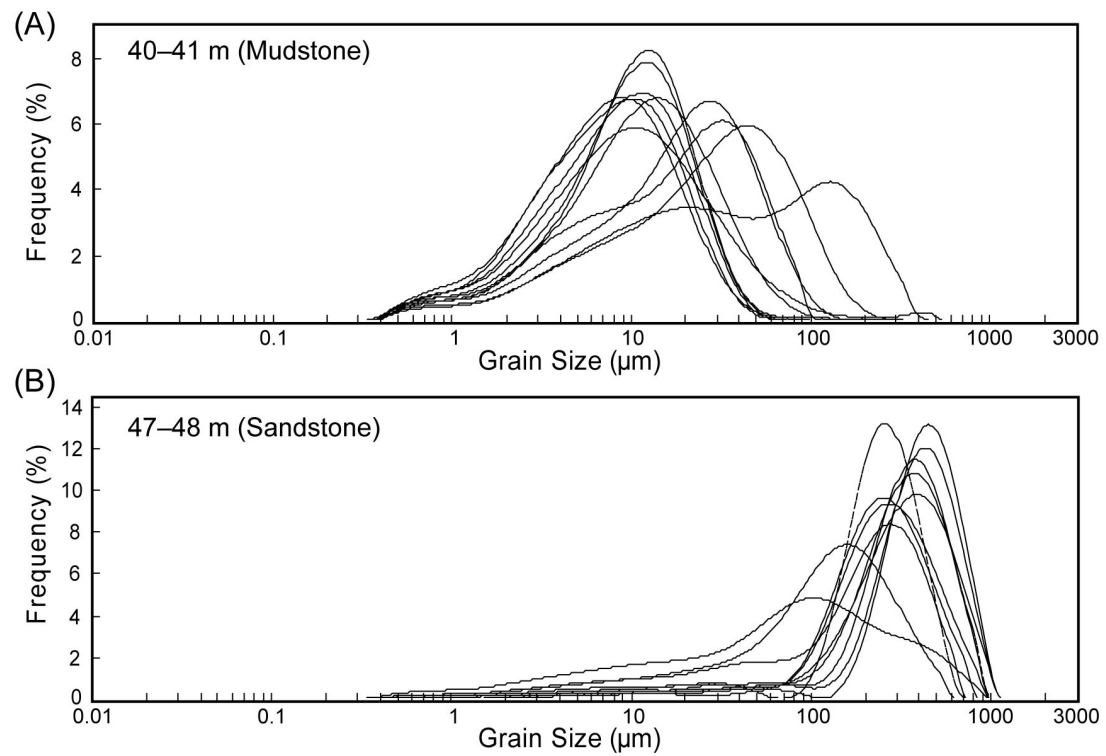
The sediments of ~60–~65 m are mainly siltstone, silty mudstone, mudstone and some fine sandstone, with massive structure, horizontal bedding, ripple cross bedding and ripple bedding, indicating sediments are primarily suspended deposits and secondarily traction current deposits. These features are consistent with ones of prodelta.

The overlying ~65–~78 m interval includes poorly sorted medium, coarse sandstone and well sorted fine, coarse sandstone layers (~2 m), with interbedded thin argillaceous sandstone layers. This part shows planar cross bedding and small ripple cross bedding, declaring sediments are formed under upper flow regime and lower flow traction currents. These features indicate a likely delta front environment.

The ~78–~85 m interval consists of medium, coarse gravelly sandstone layers (~4 m), poorly sorted, with planar cross bedding and trough cross bedding. The sediments are ligulate bar deposits and channel upper flow regime deposits. These features are consistent with features of delta plain environments. The sandstone layers are covered by mudstone layers, indicating the end of delta deposition. The sandstones of this interval show an obvious upward coarsening and thickening trend, characteristic of a deltaic environment (Song et al., 2003).



**Figure S1.** Stratigraphic thickness and sedimentation accumulation rate (SAR) plotted versus stratigraphic ages of the Herjia sequence. Vertical and horizontal error bars illustrate the uncertainties of the depths and ages, respectively. The age uncertainties were estimated based on thickness recording the magnetic reversals and the averaged sediment accumulation rate of the studied ~132 m strata.



**Figure S2.** Grain-size frequency distribution of the mudstone (40–41m) and sandstone (47-48 m).

#### REFERENCES CITED

Song, C. H., Fang, X. M., Li, J. J., Gao, J. P., Nie, J. S., and Yan, M. D., 2003, Sedimentary Evolution of the Guide Basin in the Late Cenozoic and the Uplift of the Qinghai-Tibet Plateau: *Geological Review*, v. 49, p. 337-346.