

Supplementary Information

Clay mineralogical and geochemical proxies of the East Asian summer monsoon evolution in the South China Sea during Late Quaternary

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Text S1 Major Element Composition

In Core MD12-3432, major elements of bulk sediment are dominated by SiO₂ (29%-59%), followed by CaO (4%-25%) and Al₂O₃ (10%-17%), and minor content of Fe₂O₃ (4%-7%), K₂O (2%-4%), and TiO₂ (0.4%-0.7%). All terrigenous element oxides exhibit the same variation pattern, increasing during glacial periods ([Supplementary Fig. S2](#)). On the contrary, CaO% decreases notably during glacials ([Supplementary Fig. S2](#)). Short-term variations are also observed with the same opposed pattern between terrigenous element oxides and CaO ([Supplementary Fig. S2](#)).

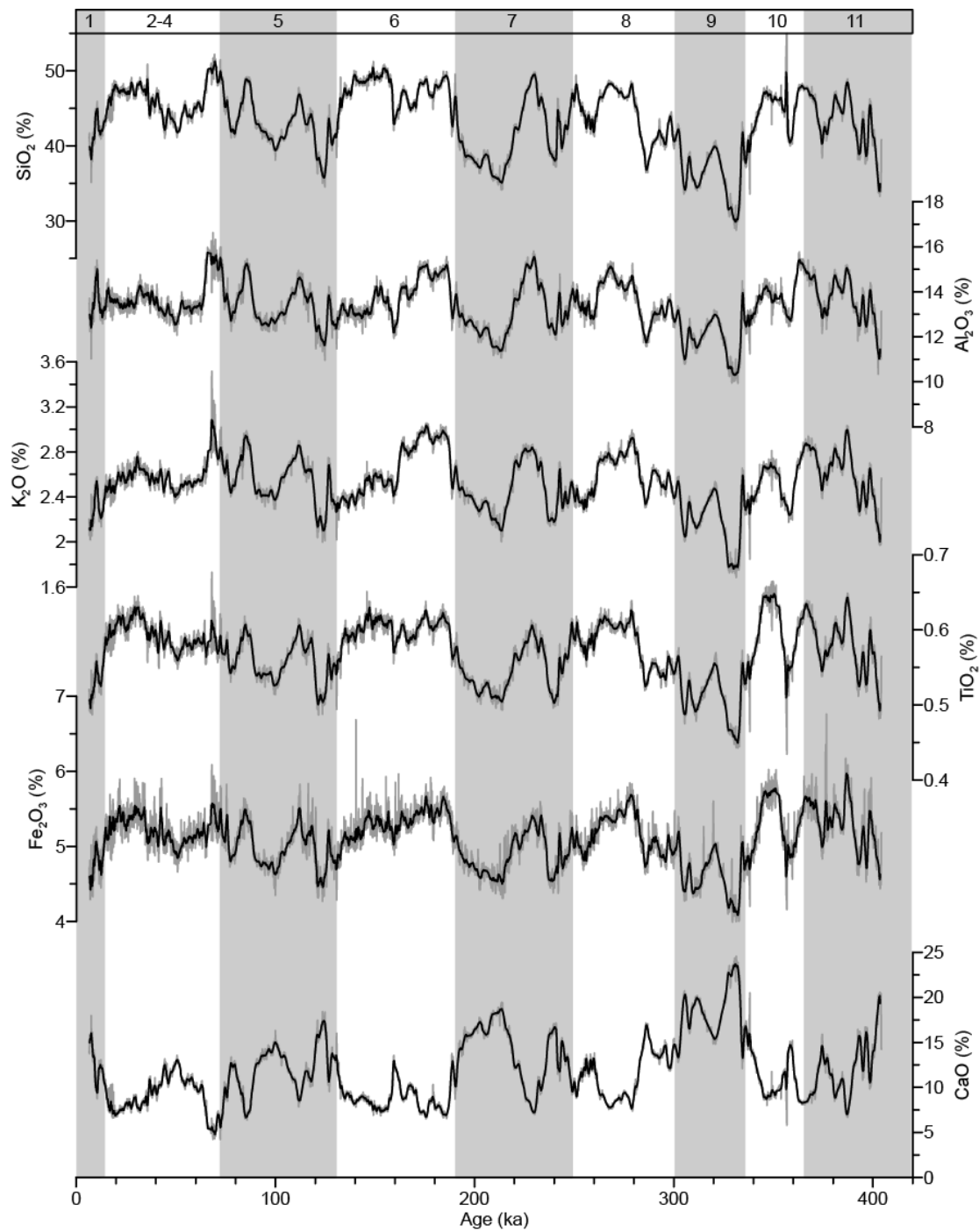


Figure S1 Composition of major element oxides calibrated from XRF-scanning data¹. Shaded areas highlight interglacial periods.

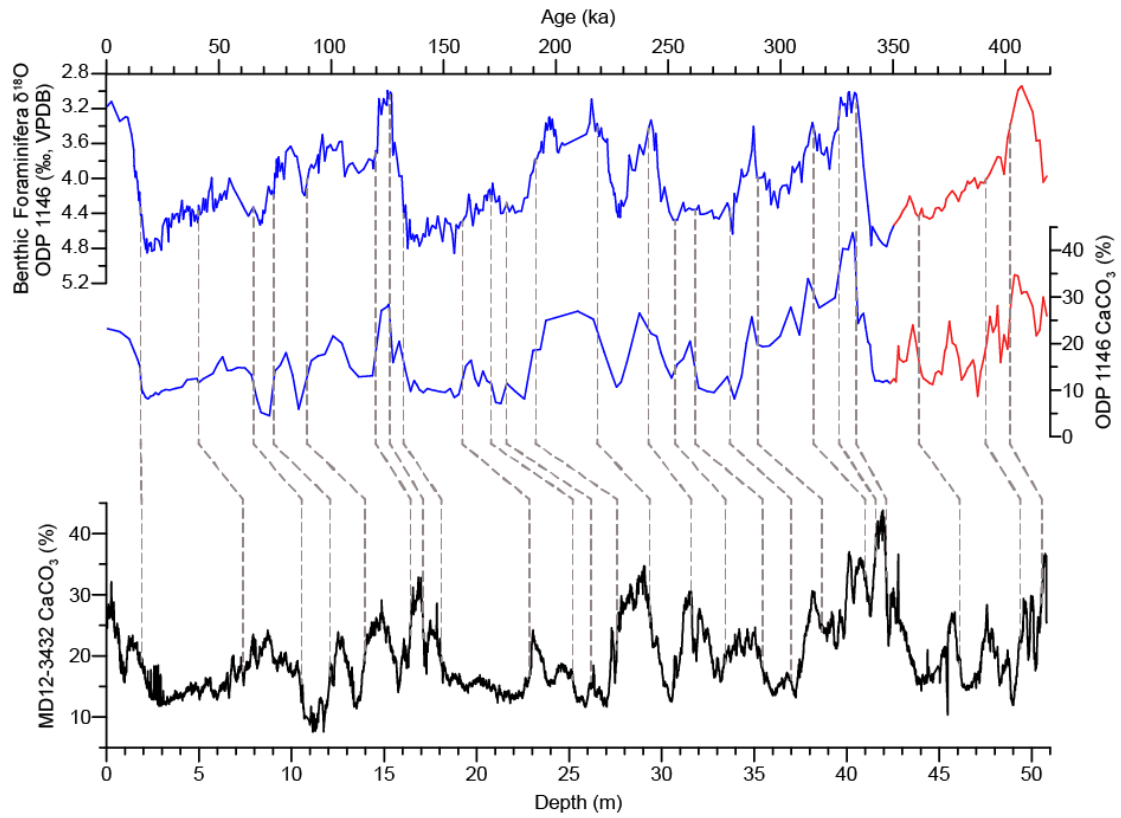


Figure S2 Age model of Core MD12-3432. Carbonate content calibrated from XRF core-scanning data is displayed versus depth, together with the age-based $\text{CaCO}_3\%$ profile and benthic foraminifera $\delta^{18}\text{O}$ record from ODP Site 1146^{2,3}. As a composite age model of ODP Site 1146 was used, the blue and red curves represent age models reported by Caballero-Gill et al.² and Clemens et al.³, respectively. Grey dashed lines illustrate the position of pair points.

Reference

- 1 Chen, Q., Kissel, C., Govin, A., Liu, Z. & Xie, X. Correction of interstitial water changes in calibration methods applied to XRF core-scanning major elements in long sediment cores: Case study from the South China Sea. *Geochemistry, Geophysics, Geosystems* **17**, 1925-1934, doi:10.1002/2016GC006320 (2016).
- 2 Caballero-Gill, R. P., Clemens, S. C. & Prell, W. L. Direct correlation of Chinese speleothem $\delta^{18}\text{O}$ and South China Sea planktonic $\delta^{18}\text{O}$: Transferring a speleothem chronology to the benthic marine chronology. *Paleoceanography* **27**, doi:10.1029/2011PA002268 (2012).
- 3 Clemens, S. C., Prell, W. L., Sun, Y., Liu, Z. & Chen, G. Southern Hemisphere forcing of Pliocene $\delta^{18}\text{O}$ and the evolution of Indo-Asian monsoons. *Paleoceanography* **23**, PA4210, doi:10.1029/2008PA001638 (2008).