Supplementary Figures

Distinct seasonal changes and precession forcing of surface and subsurface temperatures in the mid-latitudinal North Atlantic during the onset of the Late Pliocene

Xiaolei Pang\textsuperscript{1,2}, Antje H. L. Voelker\textsuperscript{3,4}, Sihua Lu\textsuperscript{5}, Xuan Ding\textsuperscript{6}

\textsuperscript{1}Institute of Ocean Research, Peking University, Beijing, 100871, China
\textsuperscript{2}School of Earth and Spaces Sciences, Peking University, Beijing, 100871, China
\textsuperscript{3}Instituto Português do Mar e da Atmosfera, Divisão de Geologia e Georecursos Marinhos, Av. Doutor Alfredo Magalhães Ramalho 6, 1495-165 Alges, Portugal
\textsuperscript{4}Centro de Ciências do Mar do Algarve (CCMAR), Universidade do Algarve, Campus de Gambelas, Edf. 7, 8005-139 Faro, Portugal
\textsuperscript{5}State Joint Key Laboratory of Environmental Simulation and Pollution Control, College of Environmental Sciences and Engineering, Peking University, Beijing, 100871, China
\textsuperscript{6}School of Ocean Sciences, China University of Geosciences (Beijing), Beijing, 100083, China

Correspondence to: Xiaolei Pang (xiaolei.pang@pku.edu.cn)
Figure S1. Site U1313 downcore Mg/Ca in comparison with Mn/Ca of species *G. ruber* white (a) and *G. hirsuta* (b). No corresponding anomalies were found.

Figure S2. Scatter plots of Mg/Ca versus Mn/Ca for species *G. ruber* white (a) and *G. hirsuta* (b). Black line indicates the best linear fit, respectively. No significant relationship between Mg/Ca and Mn/Ca is observed for either species.
Figure S3. The upper panel displays the comparison between original *G. ruber* Mg/Ca ratios (black) and the Mg/Ca ratios (red) corrected for the secular changes in the seawater of Mg/Ca (Mg/Ca$_{sw}$), dashed line indicate the core top *G. ruber* Mg/Ca ratios from nearby core SU90-03. The lower panel shows the corresponding Mg/Ca-based SST records derived from the both original and corrected Mg/Ca ratios. The dashed line represents the modern summer SST of 23 °C at Site U1313.