



**Supplementary Figure 1. | Combined records of bulk parameters, foraminiferal, stable oxygen isotope, and sea ice proxy from core KV02.** From left to right: Concentrations of grains >0.5 mm, percentage of sand (>63 μm), percentage of *Elphidium clavatum*, percentage of *Cibicides lobatulus*, benthic foraminiferal δ<sup>18</sup>O, and IP<sub>25</sub> concentrations. Light blue shading indicates a redeposited layer. Symbols next to the left and right y-axes indicate AMS <sup>14</sup>C dates.