B102-010 **Room: 202** **Time: May 22 16:15-16:30**

Testing a mid-Cretaceous glaciation hypothesis with extremely well preserved foraminferal isotopes from Demerara Rise

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Earth's climate turnover from the 'greenhouse' to the 'icehouse' represents one of the biggest revolutions in Earth climate during the last 100 m.y. While most of the present Polar Regions are covered with ice and assigned to the cryosphere, some parts of those regions were occupied by tropical breadfruits, and reptiles, including dinosaurs, during the Cretaceous period. To investigate this climatic turnover, onset timing of Antarctic glaciation has been widely debated for more than two decades. Although initial glaciation at early Oligocene has been widely accepted nowadays, rapid and large sea-level fluctuation has been reported in the mid-Cretaceous, and the Cretaceous glacioeustatic hypothesis is suddenly spotlighted.

We present new oxygen isotope records for the mid-Cenomanian from Demerara Rise that are of much higher resolution than previously available, taken from both planktic and benthic foraminifera and utilize only extremely well-preserved 'glassy' foraminifera. Those records are compared with mid-Cenomanian eustatic records to test the mid-Cretaceous glaciation hypothesis. While planktic foraminiferal isotopes stay constant during the interval analyzed, those of benthic foraminifera show –2 permil positive excursions. Because glacial fluctuation of sea water d^{18}O (d$_w$), and associated cooling, should be recorded in both of plnktic and benthic isotopes, this apparent inconsistency in d^{18}O profiles indicate that benthic d^{18}O excursions can't be attributable to glacial d$_w$ changes. Therefore, our records show no evidence of glaciation, calling into question the hypothesized ice sheets and rendering the origin of inferred rapid sea level oscillations enigmatic. Moreover,simple mass balance calculations demonstrate that this 'Cretaceous sea level paradox' is unlikely to be explained by 'hidden' ice sheets existing below the limit of d^{18}O detection. Detected positive excursions of benthic foraminferal isotopes might indicate local bottom water cooling by episodic bottom water invasion from the Southern Atlantic or changing bottom water salinities.