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The interplay of glacial/interglacial climate-CO2 and productivity effects on coccolith calcification and vital effects across the MIS 12 to MIS 9 in the western tropical Atlantic

Alba González-Lanchas[1], Heather M. Stoll[2], José-Abel Flores[1], Francisco J. Sierro[1], Ivan Hernandez-Almeida[2], and Jose Guitian[2]

[1]Departament of Geology,University of Salamanca, Salamanca, Spain (lanchas@usal.es)

[2]Department of Earth Sciences, ETH Zu□rich, Zu□rich, Switzerland

Coccolithophores play an important dual role in ocean biogeochemistry: they use dissolved inorganic carbon (DIC) in the surface for both photosynthesis and coccolith calcification. Stable isotopes in coccoliths are the result of various effects, including different vital effects, allowing hypotheses about the varying active carbon acquisition strategies in response to changing environmental conditions. Understanding the physiological mechanisms that cause these changes remains challenging.

The MIS 12 to MIS 9 interval is a crucial climatic period encompassing changing glacial-interglacial cyclicity and pronounced variations in atmospheric CO_2 concentration. Different paleorecords indicate that coccoliths were an important component of the carbonate fraction during this interval, with the outstanding worldwide dominance of the highly calcified coccolithophore species *Gephyrocapsa caribbeanica*.

The carbon isotopic fractionation during photosynthesis (εp) in alkenones, biomarkers produced by coccolithophores, is a proxy to reconstruct past aqueous CO_2 concentration. Here we present a new εp reconstruction spanning this glacial/interglacial interval (460 to 330 kyr) at ODP Site 925 in the western tropical Atlantic. We aim to evaluate the interplay of CO_2 and productivity effects on coccolith calcification and stable isotopes ($\delta^{18}O$ and $\delta^{13}C$) in coccolith calcite integrating these data with the size and thickness of coccolith platelets and the geochemical Sr/Ca record.

The comparison of mean coccolith size with coeval samples from the deeper ODP Site 929 allows the evaluation of the degree of nannofossil dissolution across the interval.