Radiocarbon records of ocean stratification during the Last Glacial Maximum

MARIA LUIZA C. FERREIRA[1], LAURA F. ROBINSON[1], JOSEPH A. STEWART[1], TIANYU CHEN[2], TAO LI[1,2], CHRISTIAN MILLO[3]

[1] School of Earth Sci., Univ. of Bristol, Bristol, BS8 1RJ, md18571@bristol.ac.uk

[2] Dept. of Earth & Planetary Sci., Nanjing University, China

[3] Institute of Oceanography, University of Sao Paulo, Brazil

Geochemical evidence suggests that the ocean at the Last Glacial Maximum (LGM) was markedly different to the modern – with enhanced stratification and reduced deep ventilation. However, records of ocean ventilation state from the LGM itself remain sparse, making links between ocean circulation, carbon storage, and glacial climate unclear.

In this study we reconstruct the radiocarbon content of Atlantic and Southern Ocean intermediate waters (800 m to 2000 m) during the LGM (27 ka to 17 ka) using the uranium-series dated skeletons of deep-sea scleractinian corals. Through combining these new records with existing data, we present the most complete picture of the circulation state of glacial intermediate ocean to date. This represents an important step towards understanding the mechanisms of carbon transfer from ocean to atmosphere during the deglaciation.