$^{231}Pa/^{230}Th$ profiles in a depth transect on the Blake Ridge over the last 30 ka

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As part of the Atlantic Meridional Overturning Circulation (AMOC) the Western Boundary Undercurrent (WBUC) transports freshly formed NADW southward along the east American continental margin. The Blake Outer Ridge (BOR) is located within the flowpath of the WBUC. Assessing the circulation strength of the WBUC is needed to evaluate the impacts on the carbon cycle of the North Atlantic during peak glacial boundary conditions. It has further been suggested that the mid-depth North Atlantic played an important role for the storage of CO_2 during cold events like Heinrich Stadials and the Younger Dryas [1,2].

We applied the $^{231}Pa/^{230}Th$ circulation proxy on sediments from ODP sites 1059 – 1062 in a depth transect from 3000 to 4700 water depth. Unlike sortable-silt data from the BOR that provide information mainly about the bottom current velocity [3], the $^{231}Pa/^{230}Th$ kinematic circulation proxy recorded an integrated signal of the moving water column. In combination with new εNd records from the same samples, capable of identifying the provenance of the prevailing water mass, our $^{231}Pa/^{230}Th$ records provide clues towards the circulation state and the strength of the WBUC. Both proxies indicate reduced circulation during the Younger Dryas and Heinrich Stadial 1 and 2 in agreement with records from below 4000 m water depth [4,5]. During the LGM the circulation is slightly weaker compared to the deep and strong Holocene circulation. With this new depth transect through the WBUC we are able to reconstruct changes in the intensity of the circulation over depth as well as their timing.

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[4] McManus et al., 2004, *Nature* **428**, 834-837.
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