Changes in North Atlantic deep water provenance across glacial Terminations during the past one million years

J.M. LINK *[1], P. BLASER[1], M. GUTJAHR[2], F. PÖPPELMEIER[3], J. LIPPOLD[3], A.H. OSBORNE[2], M. FRANK[2], E. BÖHM[4], O. FRIEDRICH[3], N. FRANK[1]

[1] Institute of Environmental Physics, Heidelberg University, Germany (*correspondence: jasmin.link@iup.uni-heidelberg.de)

[2] GEOMAR Helmholtz Centre for Ocean Research, Kiel, Germany

[3] Institute of Earth Sciences, Heidelberg University, Germany

[4] LSCE, Gif-sur-Yvette, France

The Atlantic Meridional Overturning Circulation (AMOC) plays a key role in the global heat balance and was subject to substantial changes during the Pleistocene. Dramatic variations in the density structure and deep water circulation patterns in the Atlantic occurred across glacial-interglacial cycles and themselves exerted a strong influence on climate.

We present a record of deep water mass provenance in the Northwest Atlantic covering the last one million years, with a special focus on glacial-interglacial transitions. To this end, we reconstructed dissolved deep water Nd isotopic compositions from the authigenic fraction of bulk sediments of ODP Site 1063 on the Bermuda Rise for glacial Terminations T-IV, -V, and -VII to -XII and compare these to published records of T-I, and –II [1-4]. This allows us to better characterize the state and potential role of the AMOC during major climate transitions since the late Early Pleistocene.

Following the Mid-Pleistocene Transition (MPT), the glacial maxima are characterized by comparable peak glacial Nd isotopic signatures, whereas interglacials commonly exhibit most unradiogenic signatures during the early interglacial and become more radiogenic afterwards.

In contrast to the other terminations, MIS 11 following T-V shows a sustained extremely unradiogenic isotopic signature pointing to contributions from a different deep water source. Moreover, AMOC transitions recorded within terminations before and during the MPT will be discussed.

[1] Roberts et al. 2010, *Science* **327**, 75-78.

[2] Gutjahr & Lippold 2011, *Paleoceanography* **26**, PA2101.

[3] Böhm et al. 2015, *Nature* **517**, 73-76.

[4] Deaney et al. 2017, *Nature Comm.* **8**, 14595.