with high rates of climate change, more precisely Marine Isotope Stage 3 with Dansgaard-Oeschger cycles 5-7. As both sites are strongly influenced by abrupt climate shifts, novel insights will be gained about the sensitivity of the continental hydrological cycle during climatically highly dynamic periods.

During the LGM, a southward position of the ITCZ affects the Amazon catchment, while the Orinoco catchment remains unaffected. This relationship, however, might be significantly different during phases with high summer insolation, when the ITCZ was situated far in the north. Ba/Ca and Mg/Ca values were measured in high-resolution (1 cm) for Core M78/1-235-1 and in lower resolution (4 cm) for Site 942 for the interval 36-28 kyr, which corresponds to maximum boreal summer insolation. The results indicate a high Ba/Ca variability, partly in excess of the amplitudes observed for the deglaciation previously measured (Hoffmann et al., 2014), indicating that the particular background conditions of high insolation caused a highly variable Orinoco and Amazon discharge. Therefore, the study obtains novel information on insolation-paced monsoonal dynamics and the influence of high-latitude climate forcing mechanisms on low-latitude climate during Marine Isotope Stage 3.

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IODP

Southern Ocean and Weddell Sea bottom water Pb isotope compositions trace ice sheet dynamics and regional circulation patterns today and during the past 140 ka

H.HUANG[1], M. GUTJAHR[1], G. KUHN[2], A. EISENHAUER[1]

[1] GEOMAR Helmholtz Centre for Ocean Research Kiel, Wischhofstrasse 1-3, 24148 Kiel, Germany
[2] Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Am Alten Hafen 26, 27568 Bremerhaven, Germany

Dissolved lead (Pb) is mainly supplied to the oceans by physical and chemical weathering on the continents. The short residence time of Pb in seawater on the order of only a few decades makes its isotopic compositions an excellent tracer for local continental inputs. Lead was found to be incongruently released during early chemical weathering on the continents (Erel et al., 1994), often generating a more radiogenic runoff signal compared to the bulk rock compositions (Gutjahr et al., 2009; Kurzweil et al., 2010; Crocket et al., 2012; Crocket et al., 2013). In addition, the presence of abundant ice-rafted detrital material (IRD) may also release a highly radiogenic signature in high latitude settings (Kurzweil et al., 2010; Crocket et al., 2012). In the (sub-)Antarctic marine environment, authigenic Pb isotope records from core top sediments offer the possibility of assessing spatial seawater Pb isotopic variability of subglacial Antarctic runoff. Furthermore, palaeo-seawater Pb isotope records extracted from authigenic Fe-Mn oxyhydroxides will likely record periods of enhanced iceberg calving, freshwater input, and/or associated circulation changes.

Since the leaching method for extracting authigenic Pb from Antarctic proximal bulk sediments has not been studied to date, we firstly evaluated and refined existing reductive leaching methods (Gutjahr et al., 2007; Blaser et al., 2016;) for efficient and reliable chemical extraction of bottom seawater Pb isotope signals from Weddell Sea and Southern Ocean core top sediment samples. We investigated the effects of (i) the $MgCl_2$ pre-treatment, (ii) the effectiveness of chelates as well as (iii) exposure time of sediments to reducing reagents on the Pb isotopic signals. Chelate EDTA shows stronger complexation ability to Pb than DTPA and can significantly prevent Pb from readsorption back onto sediment surfaces during leaching as described in previous studies (Gutjahr et al., 2007). We also found that leaching without extended (>20 min) shaking, hence only agitating sediments for less than a minute on a vortex mixer to help sediment disperse into leaching solution, can extract quantities of Pb as extracted with via leaching for 20 minutes in a shaker. Using this short-term "vortexing" method, reproducible and in most cases accurate isotopic ratios identical or close to seawater signals can be obtained. Therefore we suggest using the vortexing method with EDTA and without $MgCl_2$ pre-treatment to recover authigenic Pb from Antarctic ice shelf-proximal bulk sediments.

Employing this new method, we present Pb isotope records from 90 core top sediment samples from the Weddell Sea and the Atlantic sector of Southern Ocean covering ~4000 km of the Weddell Sea Antarctic continental margin. Furthermore, first results are presented from IODP Site 1094 delineating the authigenic Pb isotopic evolution over the past 140 ka tracing Antarctic ice sheet dynamics and Southern Ocean circulation.

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