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# Climatic Change during Marine Isotope Stages 11–19: First Results from Portuguese Margin Site MD03-2699

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The recently published EPICA Dome C (EPC) ice core records now allow the comparison between deep-sea and Antarctic climate records beyond 420,000 years. The Deuterium record of EPC reveals dissimilarities in the interglacial values with the interglacials preceding Marine Isotope Stage (MIS) 11 having lower maxima than those of MIS 11 and younger, differences which are not visible in the benthic oxygen isotope record. In order to find possible causes for them we are studying at high resolution the sections older than MIS 10 in Calypso core MD03-2699, retrieved from 1895 m water depth on the western edge of the Estremadura Spur. Nowadays, the site is bathed by upper North Atlantic Deep Water. During May to September the surface water over the region is influenced by upwelling. First results from multi-element XRF measurements, sedimentology and biomarker analyses will be presented. Like in other cores from the Iberian margin MIS 11 stands out as the interval of the lightest sediment color and high Ca and Sr values. Using this observation as basis, a preliminary age model for the core sections below MIS 10 was established by correlating the XRF-Ca record with the EPC Deuterium record. MIS 11 has the highest sedimentation rate with 6.6 cm/kyr, followed by MIS 15 and 17 with rates around 3 cm/ kyr. Sedimentation rates break down during glacials, especially during MIS 12 and 14, when intervals of foraminiferal-rich clayey sands hint to extensive winnowing by a deeper flowing Mediterranean Outflow as also observed during MIS 2 along the southwestern margin

(Schoenfeld & Zahn 2000). Glacial and stadial periods, furthermore, reveal increases in the iron and titanium contents. Both elements are indicators for terrestrial input and could be linked to strengthened Saharan dust outbursts during colder and drier climate conditions. All interglacials are highlighted by maxima in the Ca and Sr contents, but the signals are less pronounced during MIS 19. From these two records the hydrographic conditions during MIS 11 and the second phase of MIS 15 seem to have been similar and associated with a higher carbonate production – to a large part of Coccolithophorids – than during the other interglacials. For the interval from mid-MIS 11 to MIS 15, the upcoming biomarker results will give further insights into productivity (total alkenone content) and sea surface temperature changes and help to differentiate between hydrographic conditions during the different interglacials.