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Climate Changes in the western Iberian Margin during Marine Isotope Stages 15-9 (580 TO 300 KA): Suborbital Glacial variability

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Past sea surface water conditions of the western Iberian margin were reconstructed based on biomarker analyses of a marine deep sea core MD03-2699 from the Estremadura Spur north off Lisbon, providing new insights into orbital and suborbital-scale climate variability between Marine Isotope Stage (MIS) 15 to MIS 9 (580 to 300 ka). We use biomarker based proxy records such as the alkenone unsaturated index to estimate sea surface temperature (SST), the total alkenone concentration to reconstruct phytoplankton productivity and terrestrial biomarkers to evaluate the continental input. The results extend the existing biomarker record namely the SST for the Iberian Margin back to the 6th climatic cycle (580 ka). A general trend of stable interglacials contrasts with glacial periods and glacial inceptions which are marked by high-frequency variability. Thus, several short-lived climatic coolings were identified by large SST decreases, the occurrence of ice-rafted detritus (IRD) and high percentages of the tetra-unsaturated alkenone C_{37:4}. Some of these events were extremely cold and similar in their general trends to the well known Heinrich events of the last glaciation. We identified 8 Heinrich-type events between 580 and 300 ka. The general deglaciation pattern detected between MIS 15 and MIS 9 is similar in their general trends to that characterizing the more recent climatic cycles, i.e. marked by two coolings separated by a short warming episode which may reflect the southward, north- and southward migration of the Polar front.