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The Last Glacial Maximum and Holocene along the western Iberian Margin: paleoceanographic and paleoclimatic analyses preliminary results

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During the past 25 ky, the Earth system underwent a series of dramatic climate transitions until the most recent glacial period. It peaked about 21 ky ago during the time interval known as “Last Glacial Maximum” (LGM). This study focuses on the reconstruction of global changes occurred from the LGM to the Holocene.

For this aim coccolithophore assemblages have been studied at Integrated Ocean Drilling Program (IODP) Site U1385 (37°34.285'N, 10°7.562'W, 2578 m below sea level) located on the continental slope of the southwestern Iberian Margin in a timeframe between 25 and 0 ky. Moreover, an integration with isotopic and biogeochemical data and a comparison with other proxies were carried out.

This IODP Site nowadays is influenced by the Portugal Current system (Pérez et al., 2001; Relvas et al., 2007), whose seasonality is driven by migrations of the semi-permanent subtropical Azores High pressure system (Coelho et al., 2002). The study area also undergoes intra-seasonal oscillations mainly related to changes, during winter, of westerly wind prevalence, induced by the North Atlantic Oscillation (Trigo et al., 2004).

Coccolithophore data were carried out by sediments from the first four sections of the core A of the IODP Site U1385. Coccolithophores, haptophyte algae living in the photic zone, are sensitive to some environmental parameters as temperature, salinity, availability of nutrients and sunlight. Thanks to their ecological sensitivity, coccolithophores are able to record paleoceanographic changes and for this reason are considered to be an important proxy to study the climate variability.

The age model was calculated using linear interpolation between 64 tie points based on log (Ca/Ti) records of Site U1385 and MD01-2444 (Hodell et al., 2015; Datema et al., 2019) and on $\delta^{18}\text{O}$ records of Site MD01-2444 and Greenland (Hodell et al., 2013). About 500 samples were sampled and preliminary results are based on the analysis of samples with a time-resolution of about 0,3 ky.

The preservation of the assemblages is from good to moderate (Flores et al., 2003). For quantitative analyses, a minimum of 300 coccoliths was counted per slide in a varying number of visual fields using a light microscope at 1000x magnification. This allows a 95% level of confidence to be reached for all species present in at least 1% abundance (Patterson and Fishbein, 1989). Absolute abundance (coccoliths per gram of sediment) and nannofossil accumulation rate (NAR; coccoliths $\text{cm}^{-2} \text{ka}^{-1}$) were estimated following Flores and Siirro (1997).

The preliminary results highlight a progressive increase of small *Gephyrocapsa* and a decrease of *Emiliana huxleyi*, between 4,26 ky and 0,91 ky. Moreover, most abundant species, in this interval, are *Gephyrocapsa oceanica*, *Umbilicosphaera sibogae* and *Calcidiscus leptoporus*. Furthermore, between 18,40 ky and 14,72 ky a significant increase of *E. huxleyi* > 4 μm and *G. mullerae* occurs associated with a decrease of small *Gephyrocapsa* and *E. huxleyi*.