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Understanding MIS 11 by integrating land-sea-ice records from the SHACK site (IODP 1385, SW Iberian margin)

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The understanding of natural climate variability during past interglacials provides crucial information not only of the ongoing climate dynamics, but also of the different processes that triggered glacial inceptions. The relationship (including feedbacks) between insolation, greenhouse gas concentrations (GHG) and ice volume has been invoked to explain the diversity of interglacials (intensity, character and duration), occurring after 800 ka. Superimposed to this orbital-scale variability, climate changes at a millennial time-scale have also punctuated interglacials. Nevertheless, the external (insolation) and internal (ice volume, GHG, ocean and atmospheric dynamics, vegetation) processes controlling the magnitude of the climate optimum (warmest period), length and millennial-scale variability of past warm periods are far from being understood. Consequently, it is of extreme importance to increase the information of natural climate variations that occurred in past interglacial periods. The Marine Isotope Stage (MIS) 11, c. 425-370 ka BP, is, in terms of orbital configuration, one of the closest analogues to the present interglacial and therefore a key past warm period.
Here we show the response of SW European ecosystems to climate variability of the North Atlantic region during MIS 11, by comparing directly terrestrial and marine proxies in Site U1385, on the West Iberian margin, from IODP Expedition 339, at a high temporal resolution. Unravelling the processes behind the natural climatic variability of this interglacial at orbital, millennial and sub-millennial scales will improve current knowledge about the evolution of our present warm interval, without human intervention, and on the mechanisms that push Earth's climate into glacial conditions.