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Similarities and dissimilarities between the last two deglaciations and interglaciations in the North Atlantic region

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Sea surface temperatures (SSTs) recorded by alkenones and oxygen isotopes in the Alboran basin (cores ODP976, ODP977 and MD95-2043) are used here to describe the present interglaciation (PIG, initiated at 11.7 ka BP), the last interglaciation (LIG, onset approximately at 129 ka) and respective deglaciations at an unprecedented fine time resolution. Similarities and dissimilarities of the recorded climate progression are reviewed in comparison with ice cores and stalagmites. During deglaciations (perihelion aligned with NH summer solstice) organic rich layers were deposited, which are useful as reference. The SST trend during the PIG involved changes of about 2ºC (from 20ºC to 18ºC) but the trend was steeper than during the LIG which involved up to 5ºC change from the early interglaciation (23ºC) to immediately before the glacial inception (18ºC).

Cooling events were observed during the last deglaciation at 17 ka, 14.8 ka and 11.7 ka. They were reminiscent of cooling events during the penultimate deglaciation at 136 ka, 132 ka and 129 ka, respectively. The cold spells which coeval with the Heinrich events described in the North Atlantic were observed. They included strong multi-decadal scale oscillations that were not observed in previous studies at lower resolution. The interglacial conditions showed a long term trend towards colder SSTs that was interrupted by warm periods (ca. from 8.2 ka to 5.3 ka for the PIG and 125 ka to 121 ka for the LIG). These warm periods were exceptional, interglacial cooling is the rule. A cold spell at about 2.8 ka during the PIG, possibly mimicked during the LIG by a cold event at 118 ka that lasted and terminated the cooling trend and stabilised interglacial SST at around 18ºC. The inception within the LIG, barely evident at the beginning ca. 115 ka (perihelion aligned with NH winter solstice), culminated at 111 ka.