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Correlation between eastern Mediterranean and Greenland climate oscillations of the past 62,000 years

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Palaeoclimate studies have revealed the general high-frequency instability of Late Pleistocene climate on timescales of a few millennia, centuries or even decades. Here we present evidence for a striking relationship between the high-resolution isotope and faunal fluctuations recorded in the sediments of ODP Site 963A (central Mediterranean basin) and the high-northern latitudes rapid temperature fluctuations recorded in the Greenland ice cores.

Oxygen and carbon isotopes, planktonic foraminifer and calcareous nannofossil records suggest that Dansgaard–Oeschger (DO) and Heinrich events (HE) are strongly expressed in the Mediterranean climate. Moreover, recurrent although subdued oscillations recorded both in the Mediterranean and GRIP records between the classic D/O events document a century scale common influence of atmosphere/ocean forcing on the Greenland and Mediterranean climates.

Alternation between climate regime dominated by polar outbreaks during D/O stadials and seasonal northward displacement of the Intertropical Convergence Zone (ITCZ) during the D/O interstadials, intensifying runoff and inducing E-P change in the Eastern Mediterranean basin, is well expressed in the ODP Site 963A records and confirms the role of the Mediterranean basin as reliable recorder of the interplay between high-latitude/tropical climate forcing. The D/O warmer and humid phases, induced stratification of the water column, although preserving intermediate and bottom water formation, though with a parallel relative declining of surface productivity.

Conversely, Eastern Mediterranean Bottom Water (EMBW) production was in-

terrupted during the HE intervals due to the intense dilution of the surface Atlantic waters entering the eastern Mediterranean which reduced the loss of buoyancy in the eastern part of the basin. Thus, a less dense and salty Mediterranean Intermediate Water (MIW) appear to co-occur with an "older" bottom water (possibly produced during the preceding interstadial interval) flowing towards the Western Mediterranean basin and preserving unchanged isotope features.