

# Millennial to orbital-scale variations of drought intensity in the Eastern Mediterranean

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## 1. Supplementary Figures

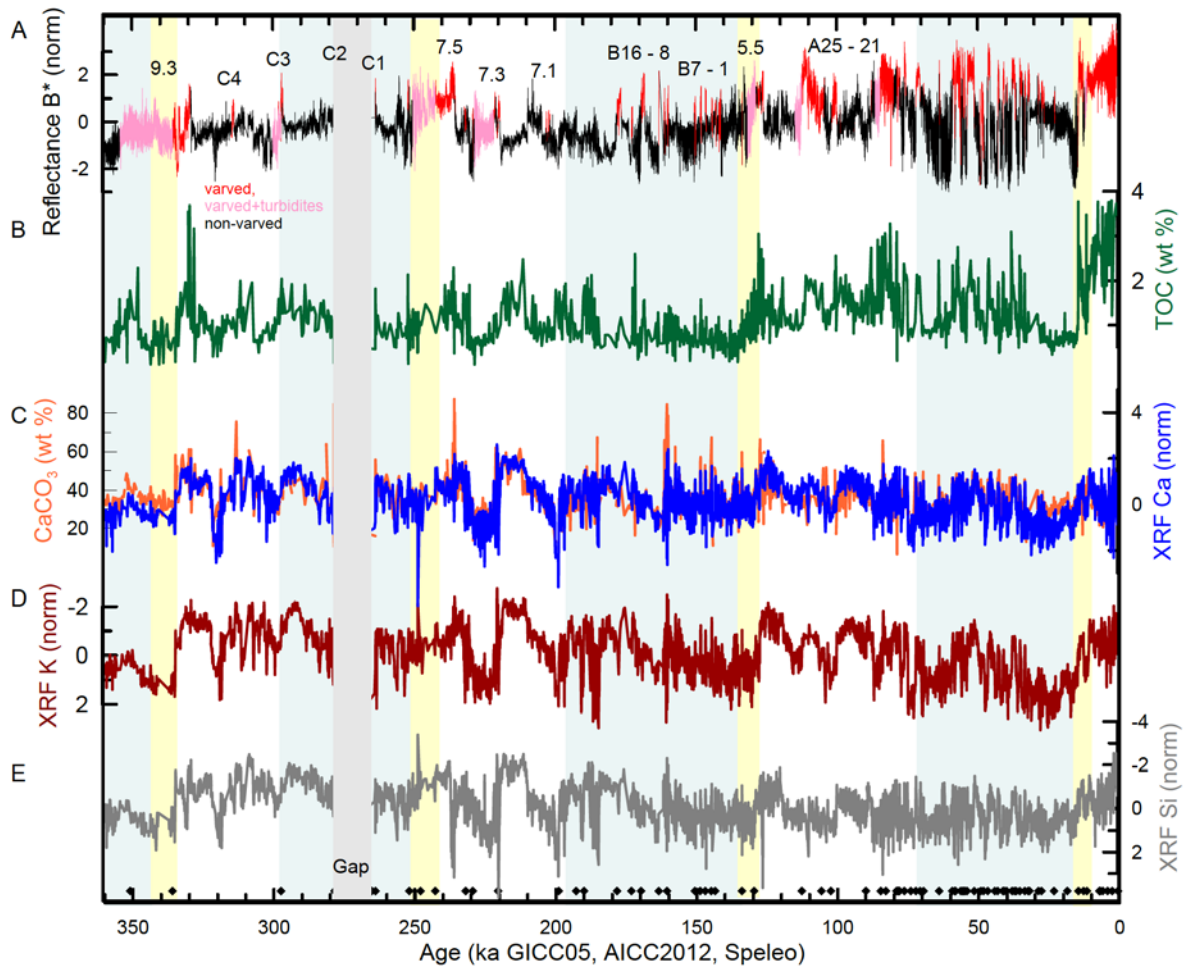


Fig. S1. Proxy records of the Lake Van sediment reflecting lake processes from 0-360 ka. (A) B\* reflectance; (B) Total organic carbon (TOC); (C) Calcium carbonate content (CaCO<sub>3</sub>; (orange) and Ca,

(blue); (D) K (brown) XRF intensities; (E) Si (purple grey) XRF intensities. (A) to (E) were used for the principal component analysis (PCA) excluding CaCO<sub>3</sub>. Black diamonds depict the age control points. Shaded area represents the gap (grey), the glacials (blue) and the terminations (yellow) following the Marine Isotope Stage (MIS) boundaries (Lisiecki and Raymo, 2005). Interglacial substages follow the nomenclature of Jouzel et al., 2007. Dansgaard-Oeschger events of the last glacial (A1-25, see Table S1 for references), of MIS 6 (B16-1) and of MIS 8 (C4-C1) are enumerated continuously.

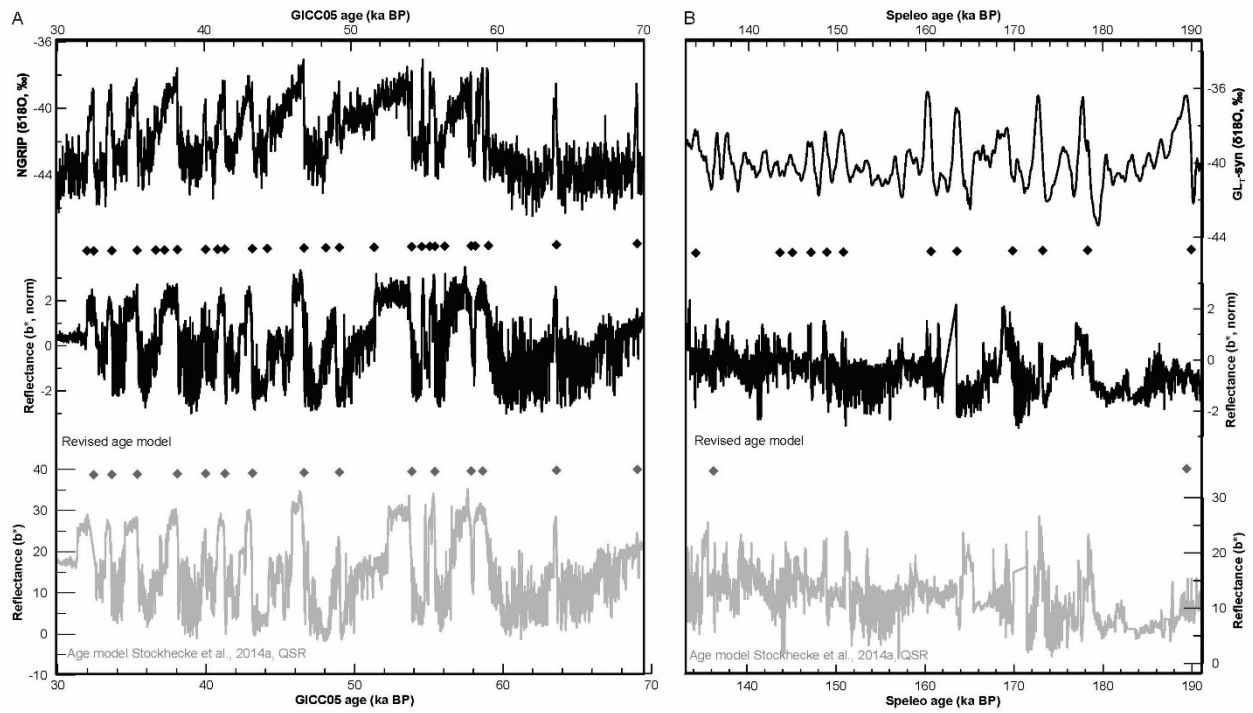


Fig. S2. Reference records (NRGIP and  $GL_{T-syn}$ ) and the Lake Van B\* record plotted on the revised age model used within this study (in black) and on the old age model published in Stockhecke et al., 2014a (in gray) from 30 to 70 ka (A) and from 133 to 192 ka (B).

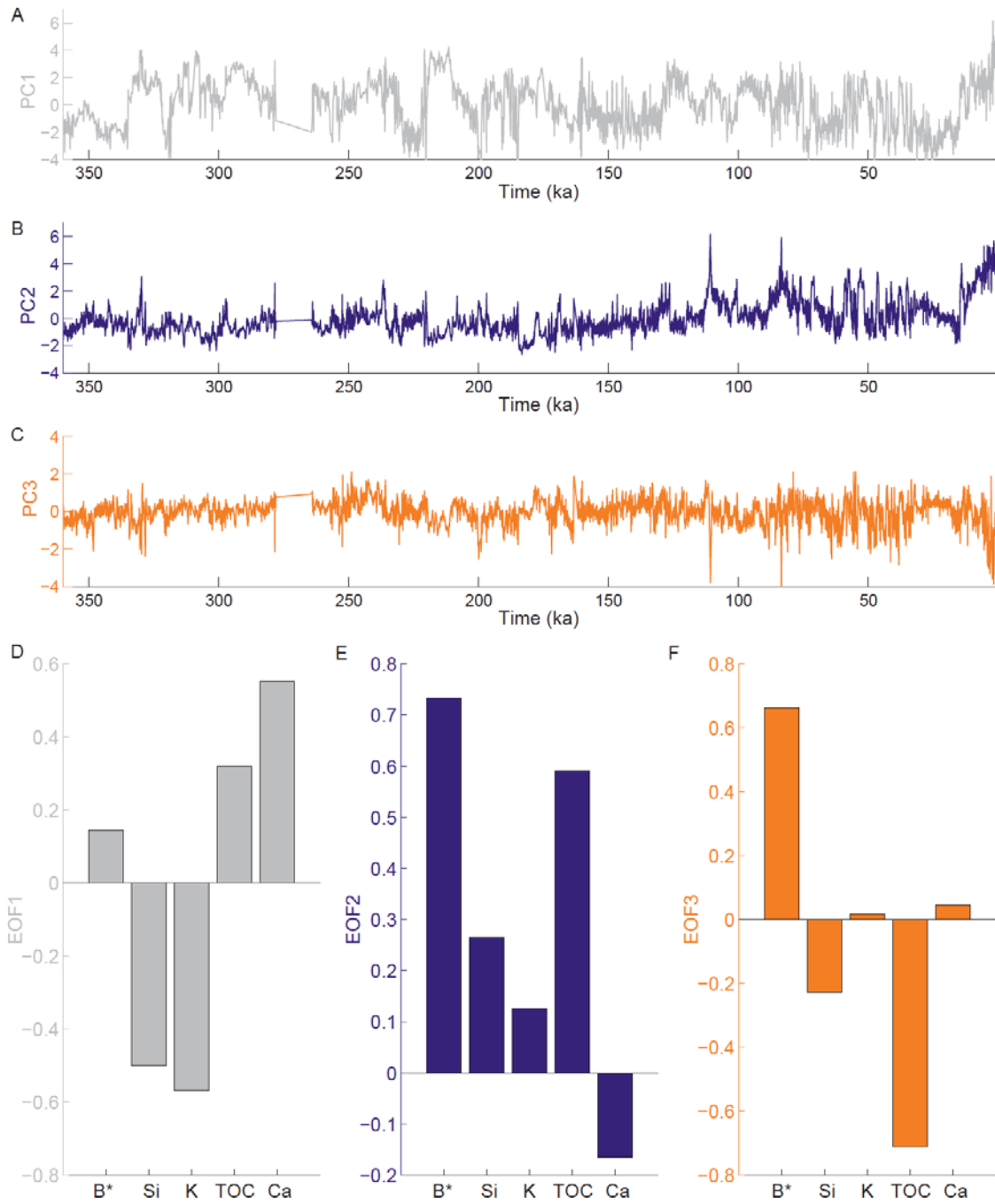


Fig. S3. Results of the Empirical Orthogonal Function (EOF) analysis. (A) Principal Component 1 (PC1) (56% of variance); (B) PC2 (28% of variance); (C) PC3 (9% of variance); (D) EOF 1; (E) EOF 2; (F) EOF 3.

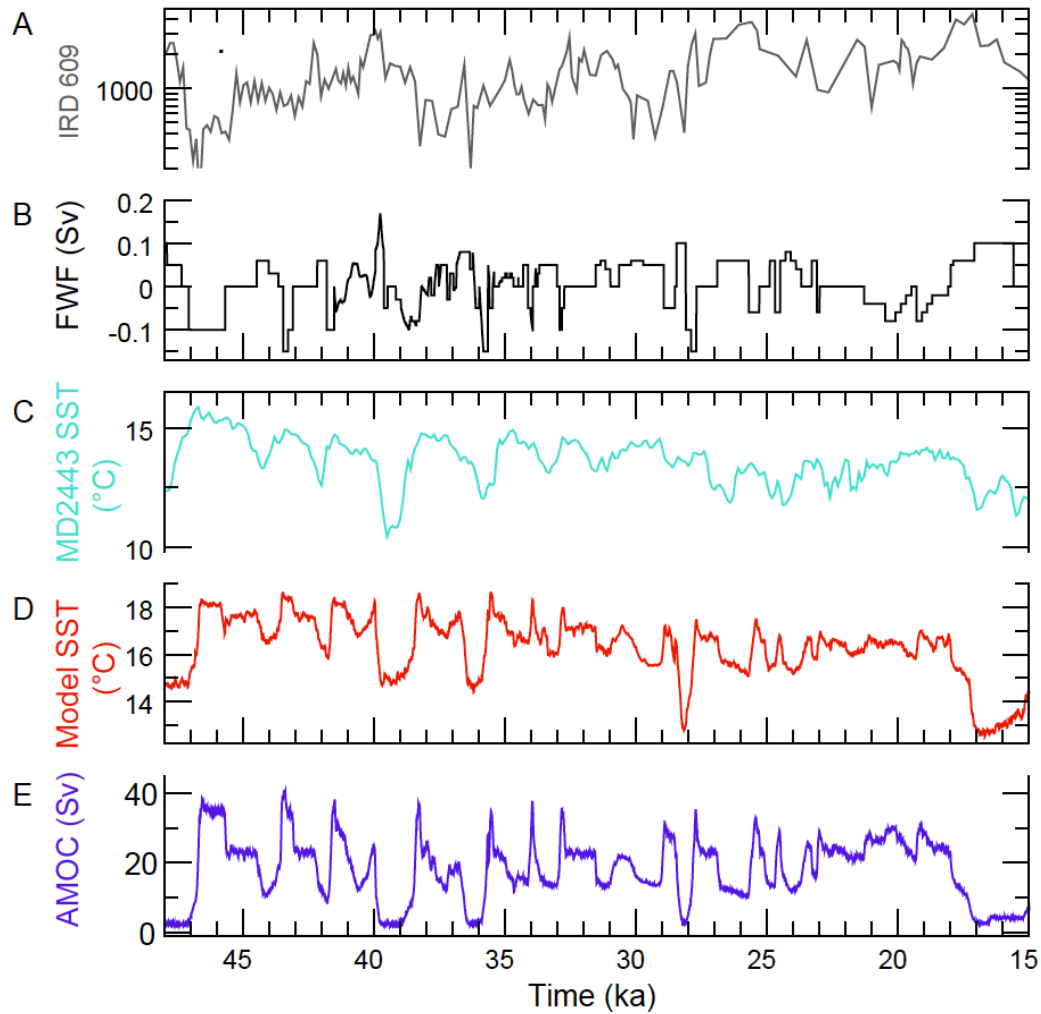


Fig. S4. Parameters of the 50-11 ka global hindcast simulation. (A) Ice-rafted debris (IRD) record from ODP609 (Obrochta et al., 2012); (B) North Atlantic freshwater forcing (FWF, Sv) applied to LOVECLIM; (C) Sea surface temperatures (SST in °C; MD2443) from MD01-2443 (Martrat et al., 2007); (D) Simulated sea surface temperatures (Model SST in °C) for the Iberian Margin region (Meniel et al., 2014); (E) Simulated maximum of the North Atlantic meridional streamfunction representing the Atlantic Meridional Overturning Circulation (AMOC, Sv) in LOVECLIM (Meniel et al., 2014). All data are shown on projected GICC05 timescale.

## 2. Supplementary Tables

Table S1. Refined age model for the Lake Van sedimentary section (ICDP PALEOVAN Ahlat Ridge (AR) site 5034-2) over 600 kyrs. The depth is given in composite meters below lake floor (mblf) and event-corrected composite meters below lake floor (mcbf-nE). Proxy data can be transfer between different timescales as ages of the GICC05, GICC05modelext, AICC2012, Speleo and EDC3 are shown (n.e.: not existent). Numbers in bold depict the used age model. Ages with their corresponding uncertainties are given in ka (n.s.: not specified).

Table S2. High-resolution timeseries of B\* and lithological log.

Table S3. 10 kyr resolved timeseries of B\*, PC1, CaCO<sub>3</sub>, Ca, TOC, K, Si.

Table S4. Pollen records: AP, Quercus, Pinus, Betula in percentage.

Table S5. Model data from the 50-11 ka model simulation (AMOC, FWF, Iberian Margin temperature anomalies, Turkey precipitation anomalies, Greece forest fraction, 10-50 ka)

Table S6. Model data from the 408 ka model simulation (Precipitation anomalies, summer and winter precipitation from Turkey and temperature anomalies from the Iberian Margin, 0-420 ka)