AGU PUBLICATIONS

Paleoceanography and Paleoclimatology

Supporting Information for

Western Mediterranean Sea Paleothermometry Over the Last Glacial Cycle Based on the Novel RI-OH Index

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Additional Supporting Information (Files uploaded separately)

Captions for Data Sets S1 to S3

Introduction

The Supporting Information contains two Figures and one Table. Figure S1 illustrates how we identified and quantified OH-GDGTs. Figure S2 illustrates our assessment of biases for TEX_{86}. Table S1 summarizes our sampling strategy.

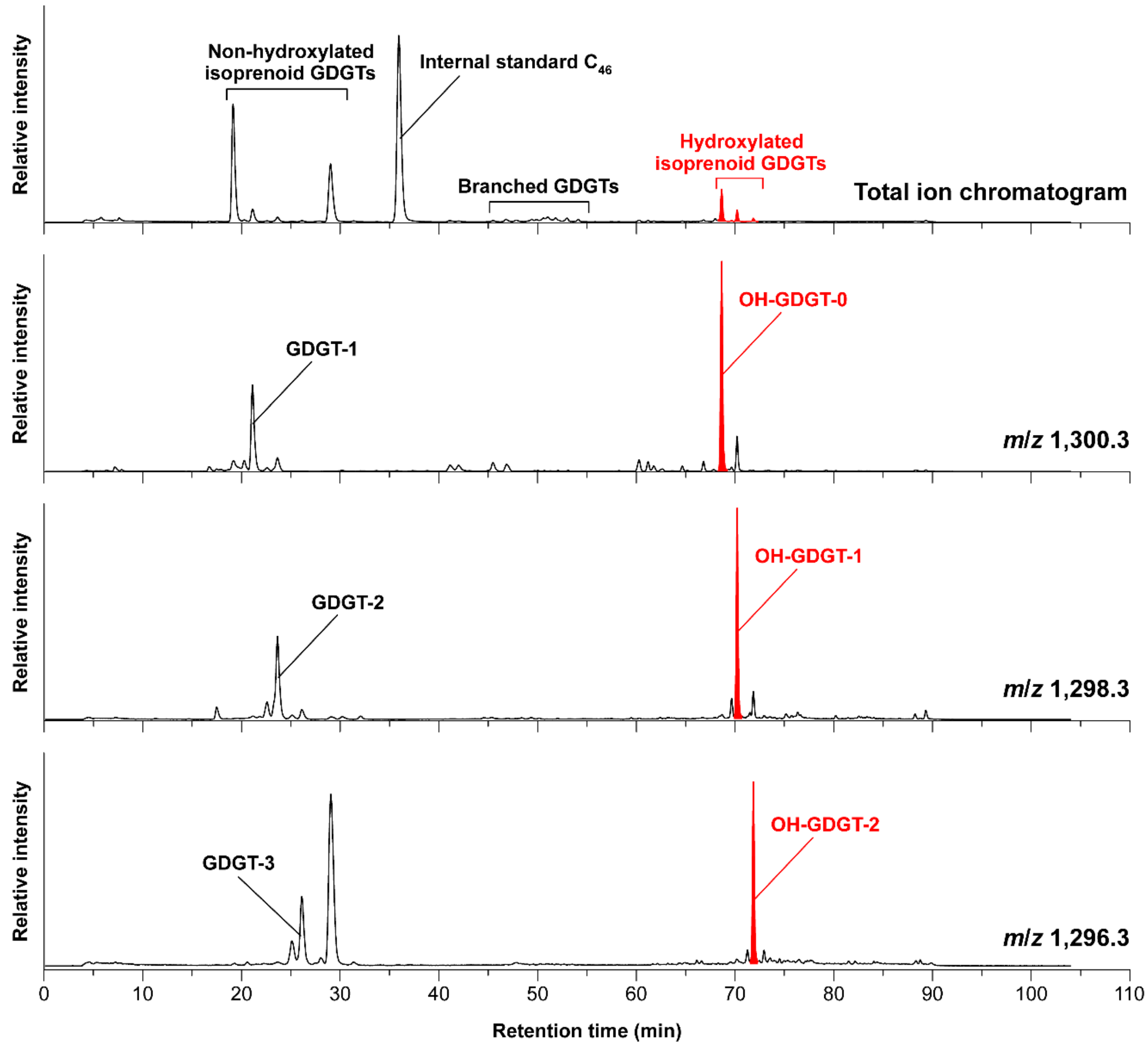

Figure S1. Total ion chromatogram and *m/z* 1,300.3, 1,298.3, and 1,296.3 single ion monitoring scans for the sediment sample MD99-2348_S12_50-52cm. OH-GDGT peaks are highlighted in red. Other families of GDGTs, the internal standard C_{46} (Huguet et al., 2006), and some iGDGTs are identified as well.

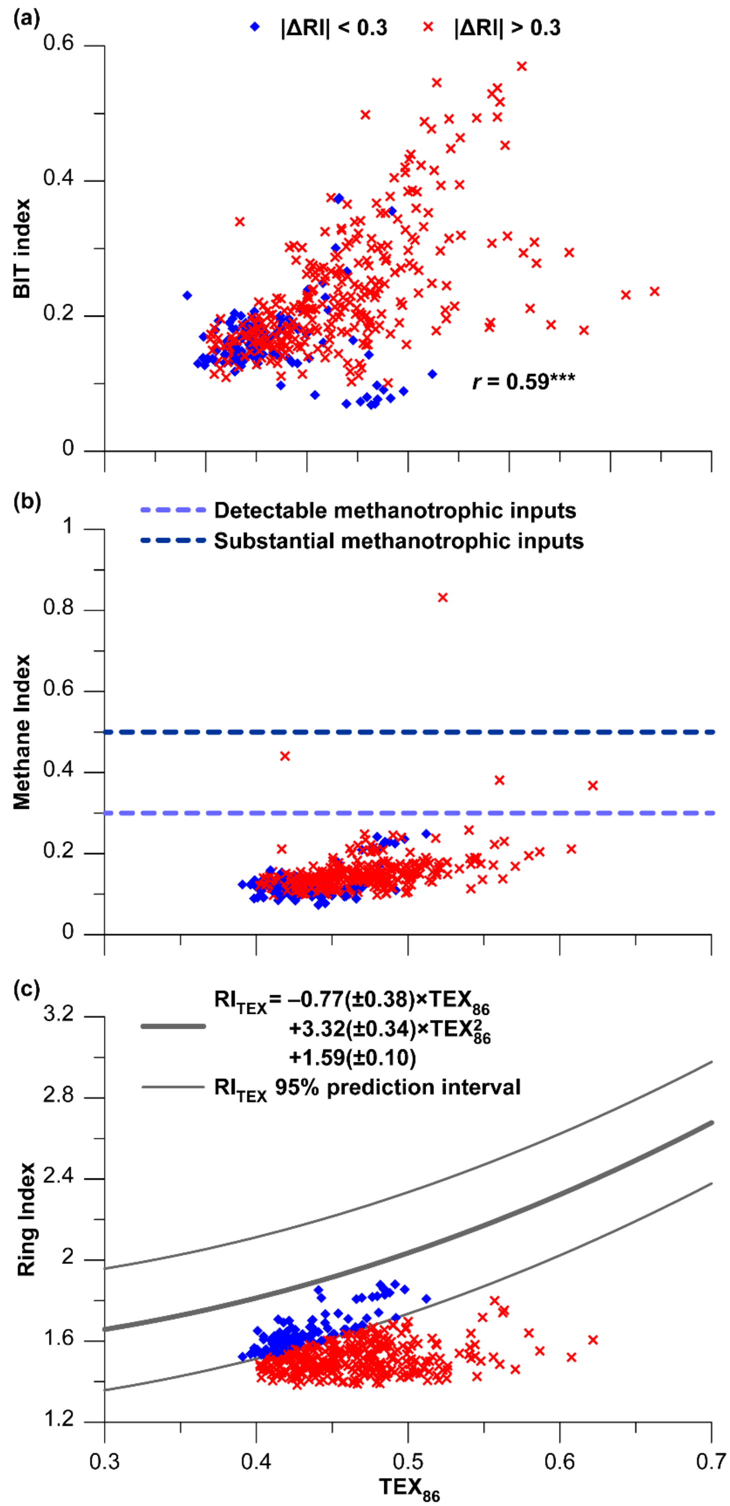

Figure S2. Assessment of biases for TEX_{86} (Schouten et al., 2002) in MD99-2348/PRGL1-4 sediments. (a) BIT index (Hopmans et al., 2004) vs TEX_{86} for terrestrial inputs. (b) Methane Index (Zhang et al., 2011) vs TEX_{86} for methanotrophic inputs. (c) Ring Index (Zhang et al.,

2016) vs TEX_{86} for all biases. Sediment samples with |ΔRI| values below and above 0.3 are distinguished.

Core/Borehole	*n*	Depth range (mbsf)	MIS	Sampling interval (cm)	Support
MD99-2348	11	0.01–0.21	1 and 2	2	U-Channels
MD99-2348	124	0.31–22.42	2	18 on average	U-Channels
PRGL1-4	86	19.20–47.75	2 and 3	34 on average	U-Channels
PRGL1-4	48	47.95–62.90	3 and 4	32 on average	Cubes
PRGL1-4	74	63.15–72.50	5	13 on average	Cubes
PRGL1-4	82	73.11–109.54	6	45 on average	Cubes

Table S1. Sampling strategy of core MD99-2348 and borehole PRGL1-4 for GDGT analysis. Sediment samples taken from U-Channels are 2-cm-thick slices. Cubes have a volume of 8 cm^3 each and were taken following as closely as possible the sampling strategy of Cortina et al. (2015, 2016). MIS = Marine Isotope Stage.

Data Set S1. Metadata (core/borehole, section, and sample name) and original data (depth, age, and tetraether-based data). The 1σ analytical uncertainties are 0.009 for RI-OH, 0.003 for TEX_{86}, BIT, and MI, and 0.019 for RI. These correspond to ranges of 0.5 and 0.2 °C in RI-OH-temperatures and TEX_{86}-temperatures, respectively. The age model is based on Sierro et al. (2009) and Frigola et al. (2012). The calibration used for RI-OH-based sea surface temperature (SST) reconstructions is SST = (RI-OH – 1.11)/0.018 (Lü et al., 2015).

Data Set S2. Annual sea surface temperature (SST) anomalies for the latest two glacial-interglacial transitions per site and per proxy. The anomalies are defined as the difference between the interglacial optimum and the preceding glacial maximum, rounded to the closest unit – SST anomaly = SST interglacial optimum – SST glacial maximum. Anomalies MIS 1 – 2 and MIS 5e – 6 refer to Holocene optimum – Last Glacial Maximum anomalies and Eemian optimum – Marine Isotope Stage 6 anomalies, respectively.

Data Set S3. Sea surface temperature (SST) anomalies between the mid-Holocene (6 ka BP) and the Last Glacial Maximum (LGM, 21 ka BP) based on all Paleoclimate Modeling Intercomparison Project Phase 3 (PMIP3) models with the corresponding runs – IPSL-CM5A-LR (Dufresne et al., 2013), FGOALS-g2 (Li et al., 2013), CNRM-CM5 (Voldoire et al., 2013), MIROC-ESM (Watanabe et al., 2011), MRI-CGCM3 (Yukimoto et al., 2012), CCSM4 (Gent et al., 2011), MPI-ESM-P (Giorgetta et al., 2013), and GISS-E2-R (Shindell et al., 2012). The anomalies are defined as the difference between the mid-Holocene and the LGM, rounded to the closest unit – Modeled SST anomaly = Modeled SST mid-Holocene – Modeled SST LGM. Model data refer to the sites with corresponding proxy data (see Data Set S2).