

Supplement of *Clim. Past*, 14, 73–84, 2018
<https://doi.org/10.5194/cp-14-73-2018-supplement>
© Author(s) 2018. This work is distributed under
the Creative Commons Attribution 3.0 License.



Supplement of

Hybrid insolation forcing of Pliocene monsoon dynamics in West Africa

Rony R. Kuechler et al.

Correspondence to: Lydie Dupont (ldupont@marum.de)

The copyright of individual parts of the supplement might differ from the CC BY 3.0 License.

Stable oxygen isotopes of benthic foraminifera of ODP Site 659 on the **original time-scale (T94)** and on the **adapted one of Clemens (T94R)** compared to LR 04 (Lisiecki & Raymo 2005)

Kendall's tau correlation	LR 04	T94
T94	0,18	
T94R	0,28	0,20

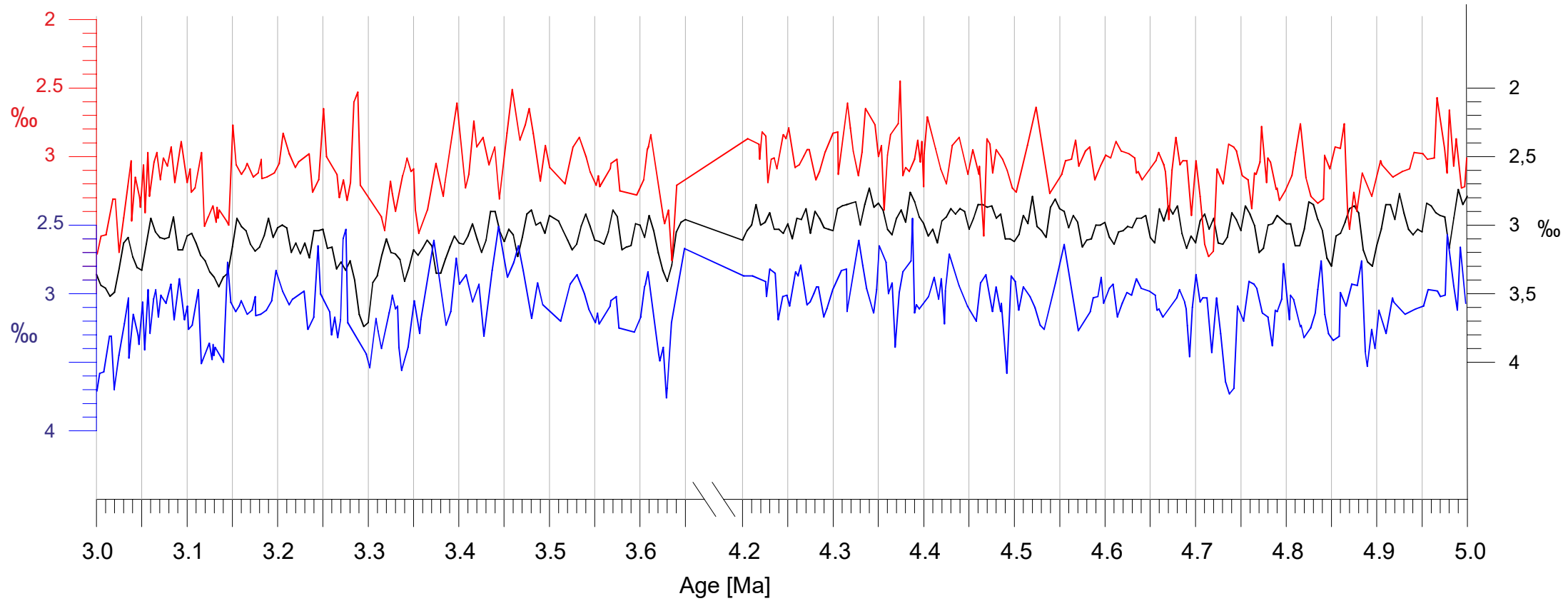


Figure SF1

Spectral analysis using REDFIT (Schulz & Mudelsee 2002) comparing the effect of different time-scales –the original dust tuned time-scale T94 in grey (Tiedemann et al. 1994) and the $\delta^{18}\text{O}_{\text{benthics}}$ based time-scale T94R in black (Clemens 1999)– on the frequency analysis of dust% (Tiedemann 1991) and δD_{31} (this study). The analysis is carried out in PAST (Hammer et al. 2001) using one segment and "false-alarm lines" based on parametric approximations (χ^2 -test). The Mid-Pliocene part runs from 3.62 to 3.00 Ma and the Early Pliocene part from 5.00 to 4.66 Ma.

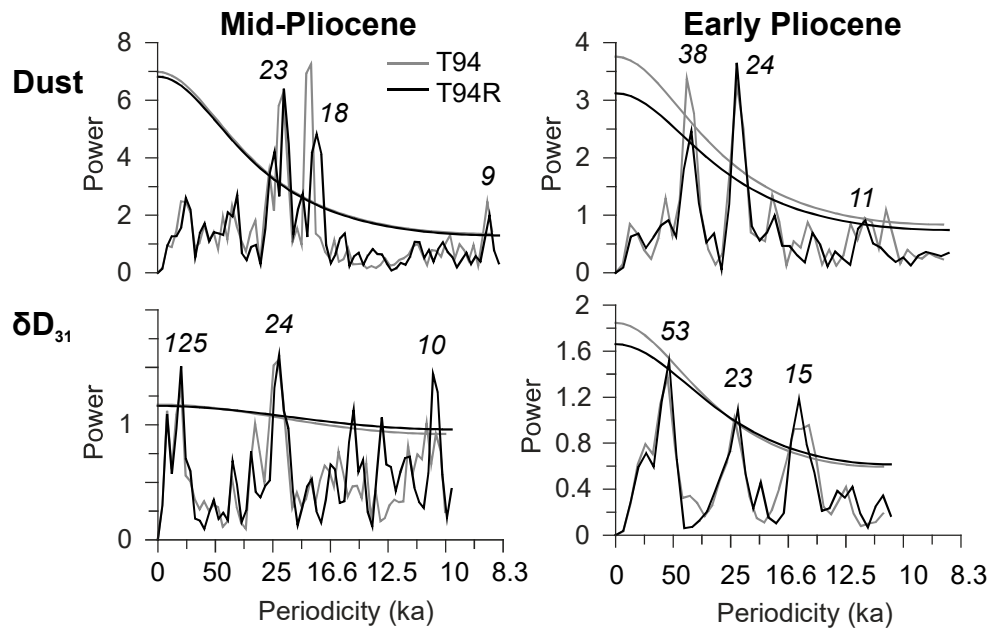


Figure SF2

Supplementary Table.

Significant power maxima in periodicity (reciprocal frequency) in ka of dust percentages (Tiedemann 1991) and δD_{31} (this study) on the original dust tuned time-scale T94 (Tiedemann et al. 1994) and the $\delta^{18}O_{\text{benthics}}$ tuned time-scale T94R (Clemens 1999) used in this study for two windows of the Pliocene: mid-Pliocene from 3.6 to 3.0 Ma and early Pliocene from 5.0 to 4.6 Ma. Frequency analysis is done with REDFIT (Schulz & Mudelsee, 2002) using the PAST package (Hammer et al. 2001). Significance is based on a X^2 -test.

* significant at the 90% level; ** significant at the 95% level; ***significant at the 99% level.

period	record	age model	T94	age model	T94R
mid-Pliocene	dust%	25	*	24,4	**
		23	***	23	***
		18	***	18	***
	δD_{31}	9	*	9	**
		125	**	125	**
		25	**	24	**
early Pliocene	dust%	10	***	10	**
		40	**	38	**
		24	***	24	***
	δD_{31}	18	*		
		11	**	11	**
		55	*	53	**
		24	**	**	
		15	***	16	***
				15	**

References

- Clemens, S.: An astronomical tuning strategy for Pliocene sections: implications for global-scale correlation and phase relationships, *Philos. T. R. Soc. Lond. A*, 357(1757), 1949–1973, 1999.
- Hammer, Ø., Harper, D.A.T., and Ryan, P.D.: PAST: paleontological statistical software package for education and data analysis, *Palaeontologia Electronica*, 4(1), 1–9, 2001.
- Lisiecki, L.E., and Raymo, M.E.: A Pliocene-Pleistocene stack of 57 globally distributed benthic $\delta^{18}O$ records, *Paleoceanography*, 20, PA1003, 2005.
- Schulz, M. and Mudelsee, M.: REDFIT: estimating red-noise spectra directly from unevenly spaced paleoclimatic time series, *Computers & Geosciences*, 28, 421–426, 2002.
- Tiedemann, R.: Acht Millionen Jahre Klimageschichte von Nordwest Afrika und Paläo-Ozeanographie des angrenzenden Atlantiks: Hochauflösende Zeitreihen von ODP-Sites 658-661, 1991. (Thesis University Kiel)
- Tiedemann, R., Sarnthein, M., and Shackleton, N.J.: Astronomic timescale for the Pliocene Atlantic $\delta^{18}O$ and dust flux records of Ocean Drilling Program site 659, *Paleoceanography*, 9, 619–638, 1994.