



*Supplement of*

## **Orbital-scale variability in the contribution of foraminifera and coccolithophores to pelagic carbonate production**

**Pauline Cornuault et al.**

*Correspondence to:* Pauline Cornuault ([pauline.cornuault@gmail.com](mailto:pauline.cornuault@gmail.com))

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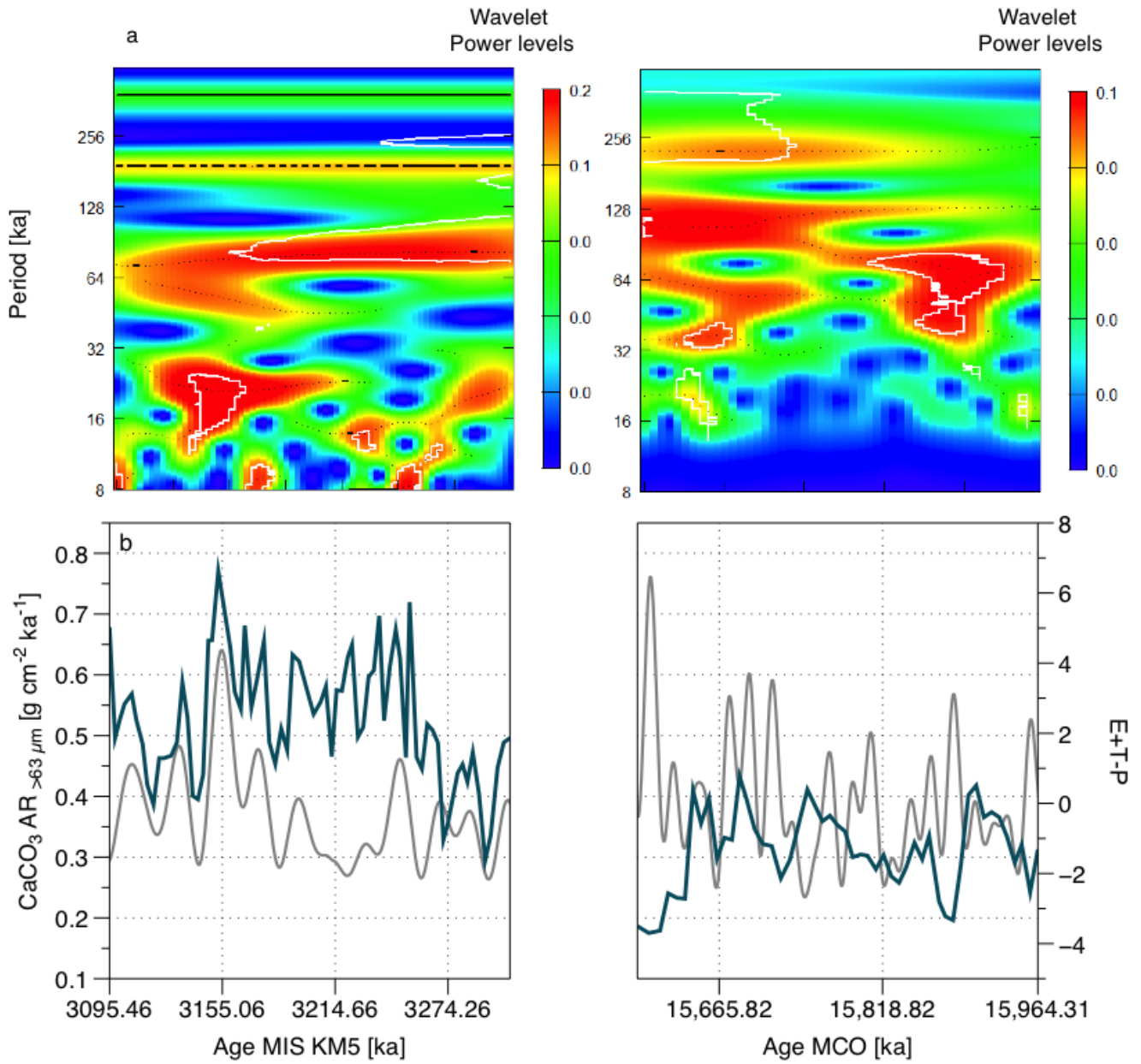


Figure S1: a) Coarse fraction CaCO<sub>3</sub> AR wavelet transform for both MIS KM5 and MCO, significance value on the figure = 0.1 and b) Coarse fraction CaCO<sub>3</sub> AR record (solid blue line) compared to E+T-P record (grey solid line) (Laskar et al., 2004).

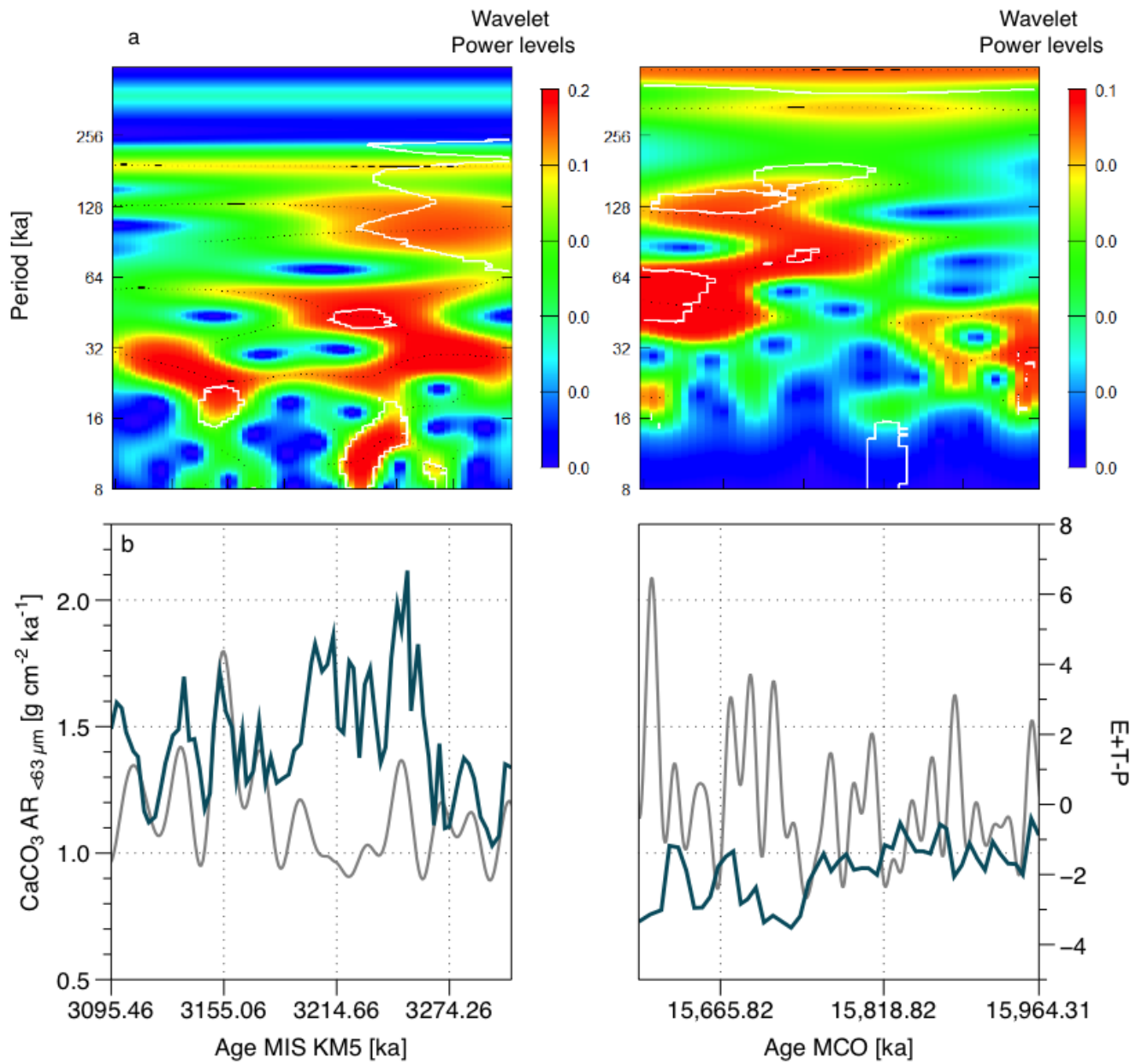


Figure S2: a) Small fraction CaCO<sub>3</sub> AR <63 μm wavelet transform for both MIS KM5 and MCO, significance value on the figure = 0.1 and b) Small fraction CaCO<sub>3</sub> AR <63 μm record (solid blue line) compared to E+T-P record (grey solid line) (Laskar et al., 2004).

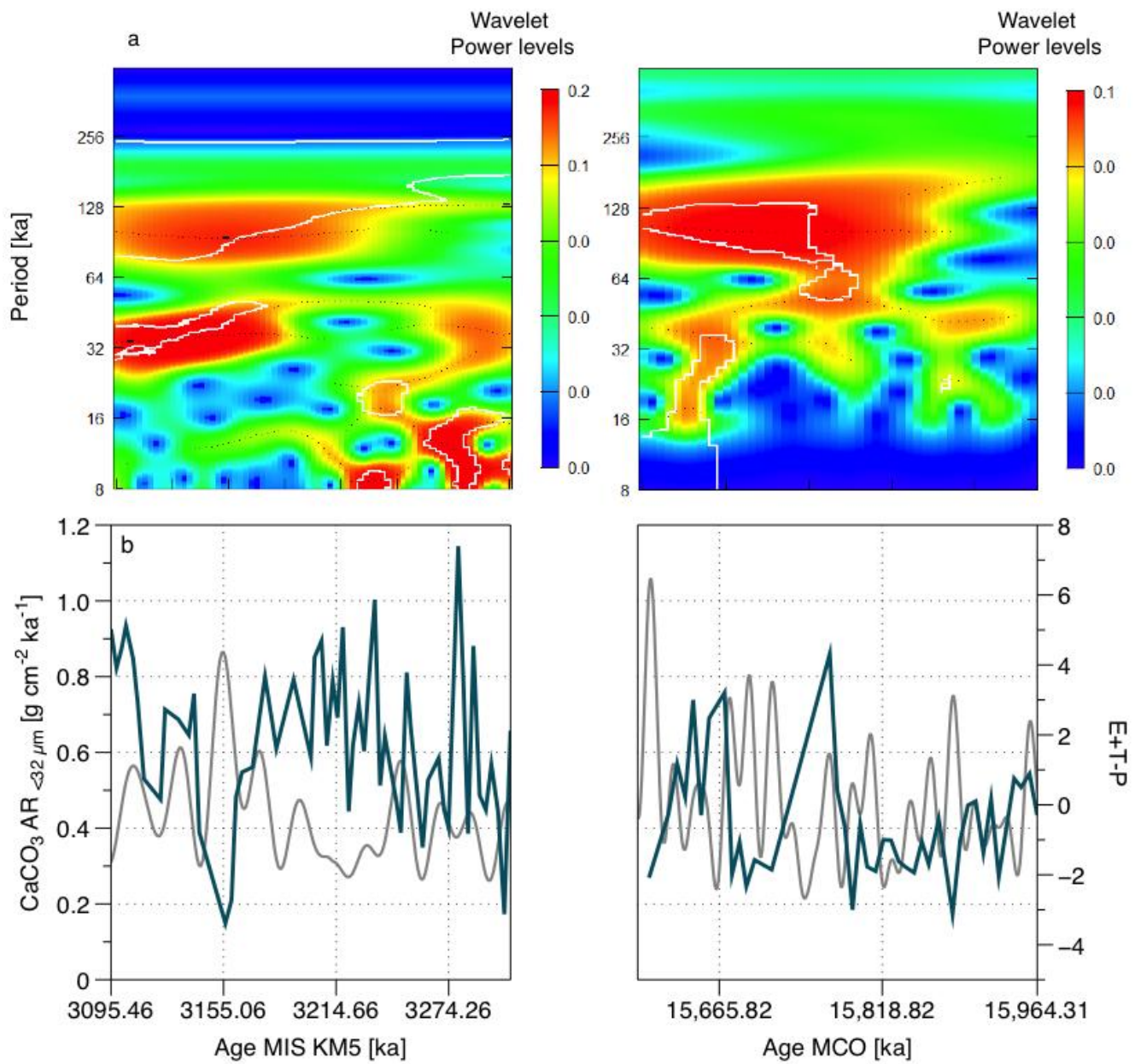
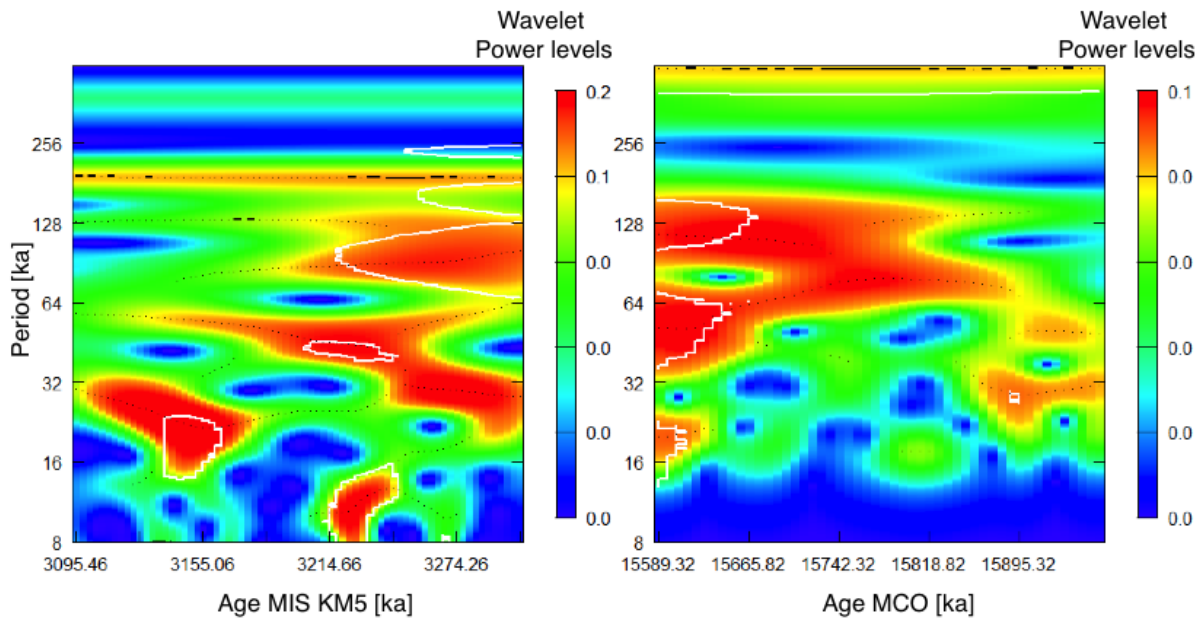
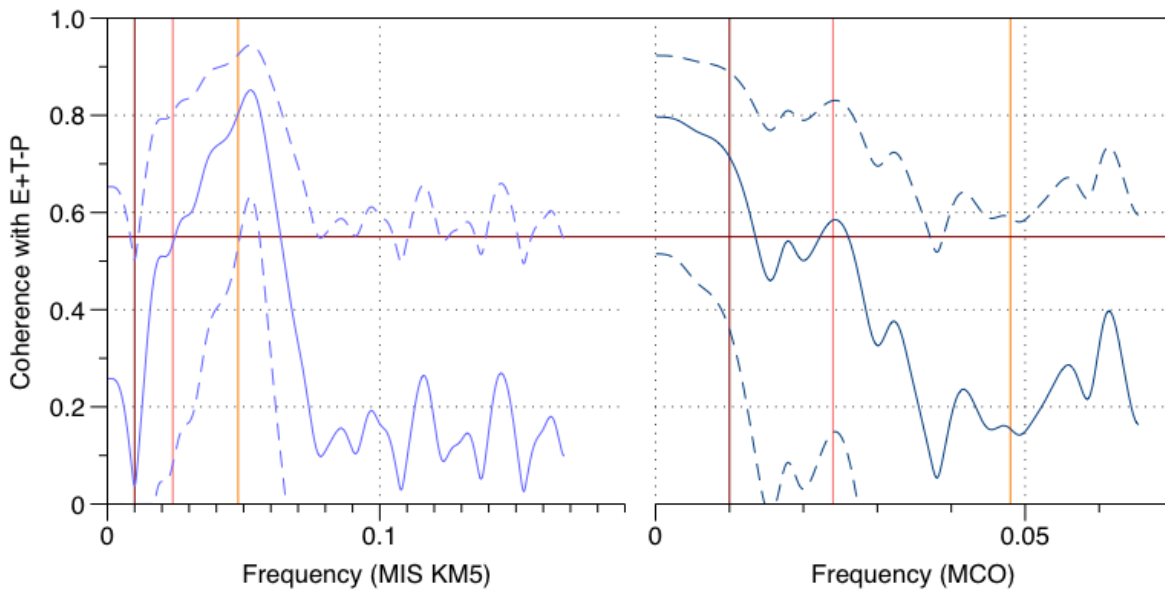


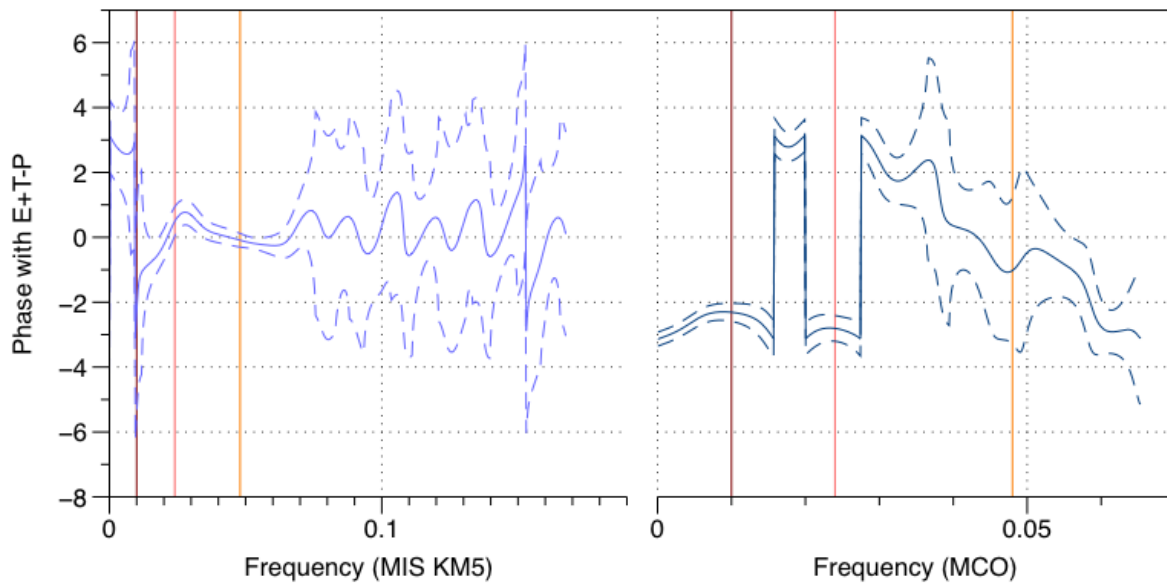
Figure S3: a) Small fraction CaCO<sub>3</sub> AR <32 μm (SYRACO approach data, without extreme values) wavelet transform for both MIS KM5 and MCO, significance value on the figure = 0.1 and b) Small fraction CaCO<sub>3</sub> AR <32 μm (SYRACO approach data, without extreme values) record (solid blue line) compared to E+T-P record (grey solid line) (Laskar et al., 2004).



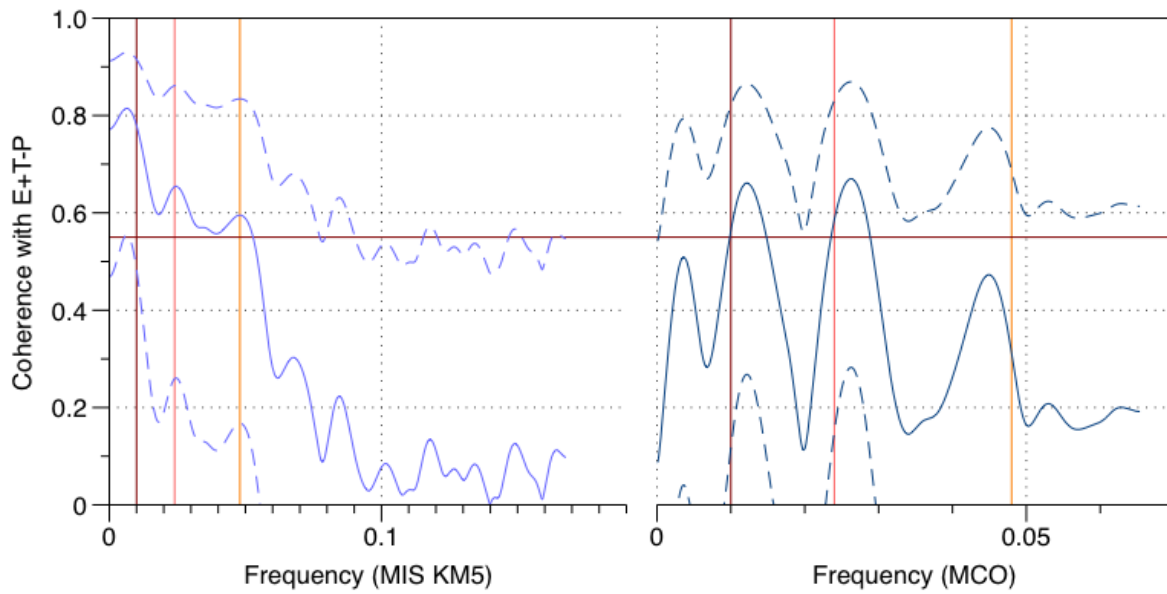
20 **Figure S4: WT analysis of the total  $\text{CaCO}_3$  AR for the Pliocene and the Miocene.**



25 **Figure S5: CBT coherence of the total  $\text{CaCO}_3$  AR with ETP for the Pliocene and the Miocene. The vertical lines correspond (from left to right) to the 100 ka (eccentricity), 41 ka (obliquity) and 21 ka (precession) periodicities, for both the Pliocene and the Miocene. The horizontal line corresponds to the non-zero coherence at a significance level of 90%.**

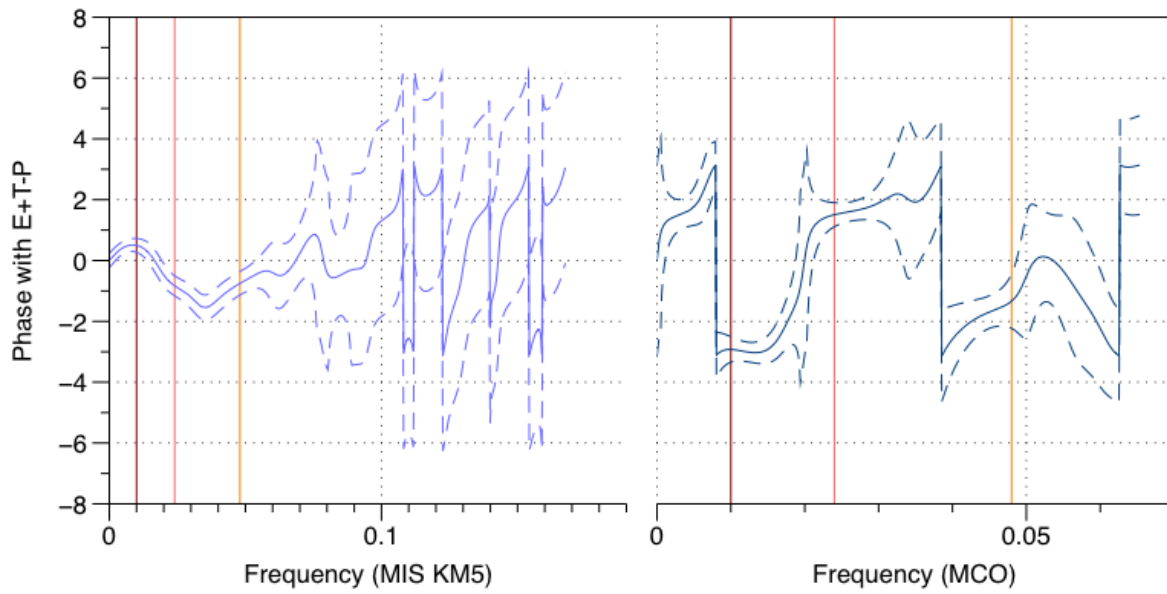


**Figure S6: CBT Phase of the total  $\text{CaCO}_3$  AR with ETP for the Pliocene and the Miocene. The vertical lines correspond (from left to right) to the 100 ka (eccentricity), 41 ka (obliquity) and 21 ka (precession) periodicities, for both the Pliocene and the Miocene.**

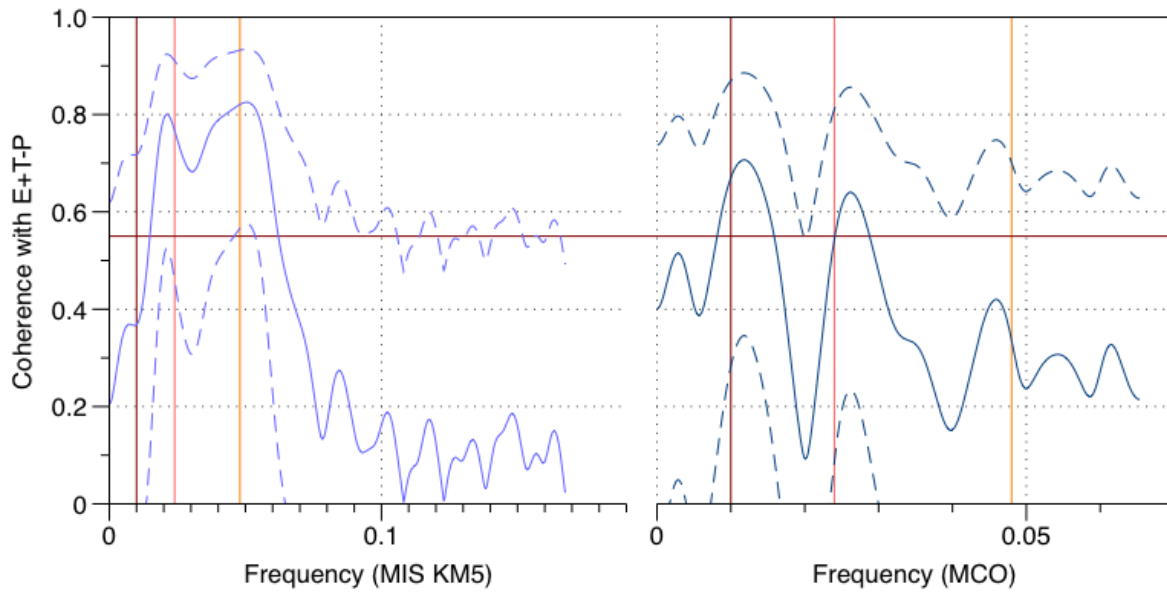


**Figure S7: CBT coherence of the contribution of the coarse fraction ( $>63 \mu\text{m}$ ) to the total  $\text{CaCO}_3$  AR with ETP for the Pliocene and the Miocene. The vertical lines correspond (from left to right) to the 100 ka (eccentricity), 41 ka (obliquity) and 21 ka (precession) periodicities, for both the Pliocene and the Miocene. The horizontal line corresponds to the non-zero coherence at a significance level of 90%.**

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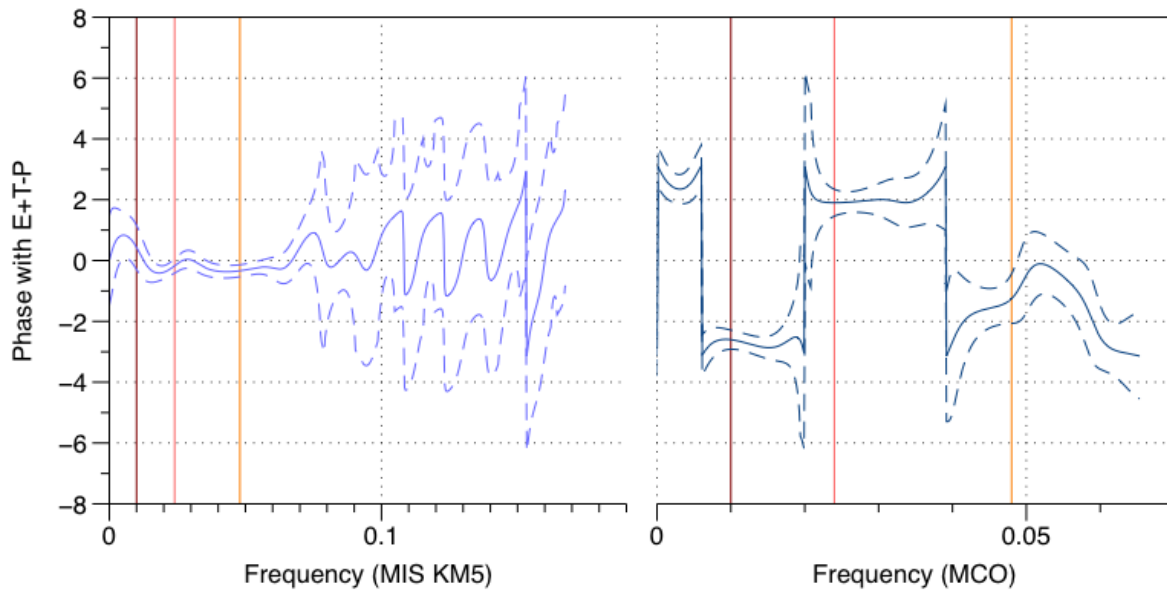


**Figure S8: CBT phase of the contribution of the coarse fraction (>63  $\mu\text{m}$ ) to the total  $\text{CaCO}_3$  AR with ETP for the Pliocene and the Miocene. The vertical lines correspond (from left to right) to the 100 ka (eccentricity), 41 ka (obliquity) and 21 ka (precession) periodicities, for both the Pliocene and the Miocene.**

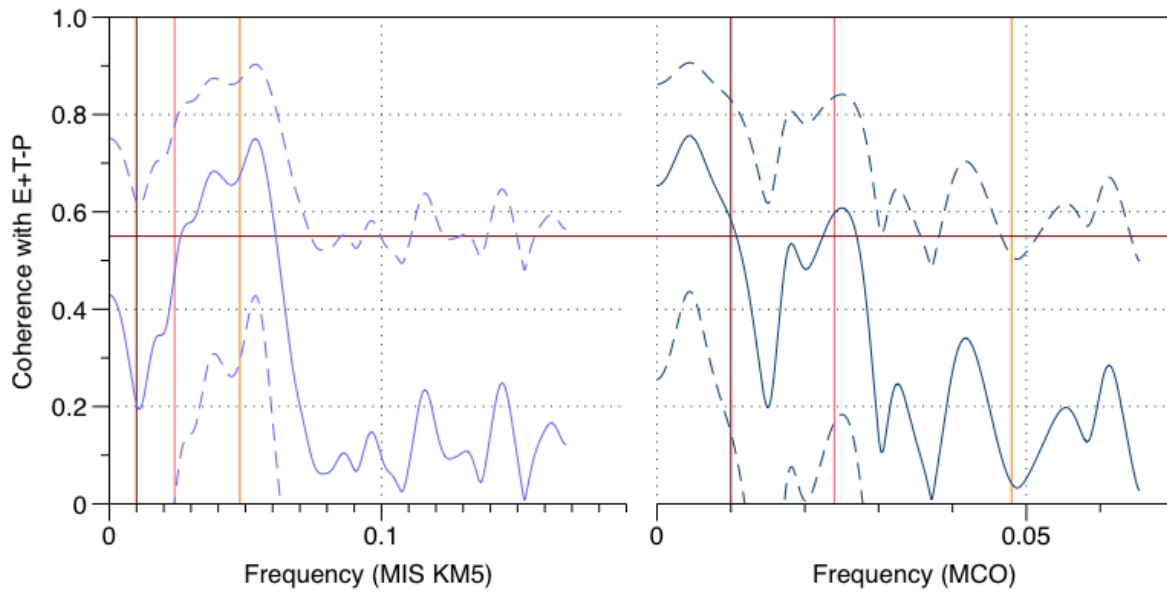


**Figure S9: CBT coherence of the coarse fraction (>63  $\mu\text{m}$ )  $\text{CaCO}_3$  AR with ETP for the Pliocene and the Miocene. The vertical lines correspond (from left to right) to the 100 ka (eccentricity), 41 ka (obliquity) and 21 ka (precession) periodicities, for both the Pliocene and the Miocene. The horizontal line corresponds to the non-zero coherence at a significance level of 90%.**





45 **Figure S10: CBT phase of the coarse fraction ( $>63 \mu\text{m}$ )  $\text{CaCO}_3$  AR with ETP for the Pliocene and the Miocene. The vertical lines correspond (from left to right) to the 100 ka (eccentricity), 41 ka (obliquity) and 21 ka (precession) periodicities, for both the Pliocene and the Miocene.**



50 **Figure S11: CBT coherence of the small fraction ( $<63 \mu\text{m}$ )  $\text{CaCO}_3$  AR with ETP for the Pliocene and the Miocene. The vertical lines correspond (from left to right) to the 100 ka (eccentricity), 41 ka (obliquity) and 21 ka (precession) periodicities, for both the Pliocene and the Miocene. The horizontal line corresponds to the non-zero coherence at a significance level of 90%.**



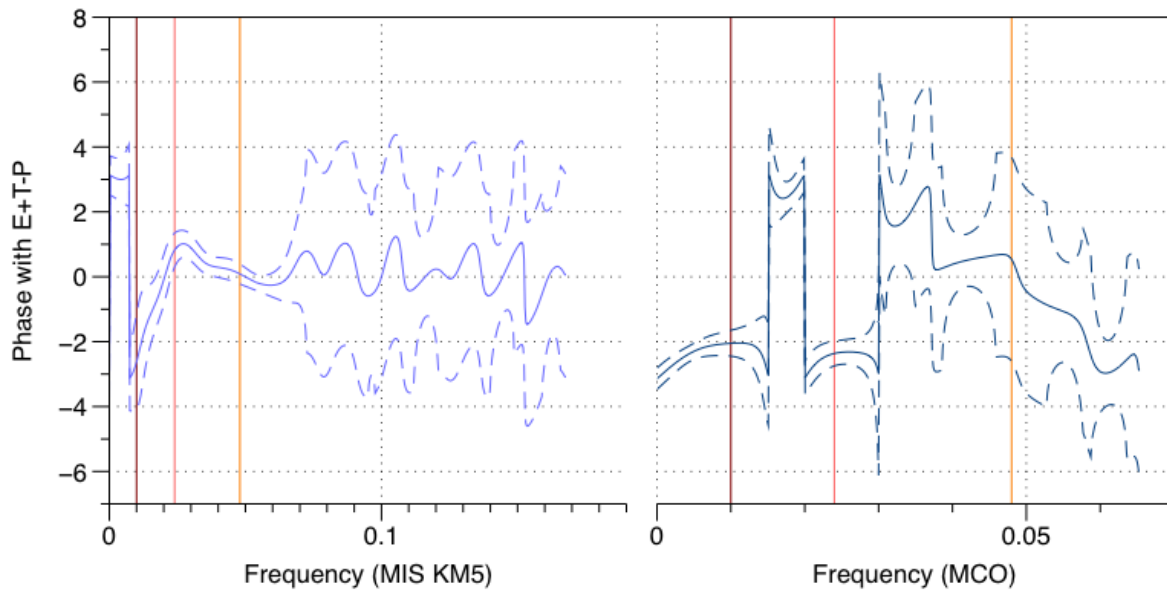


Figure S12: CBT phase of the small fraction (<63  $\mu\text{m}$ )  $\text{CaCO}_3$  AR with ETP for the Pliocene and the Miocene. The vertical lines correspond (from left to right) to the 100 ka (eccentricity), 41 ka (obliquity) and 21 ka (precession) periodicities, for both the Pliocene and the Miocene.

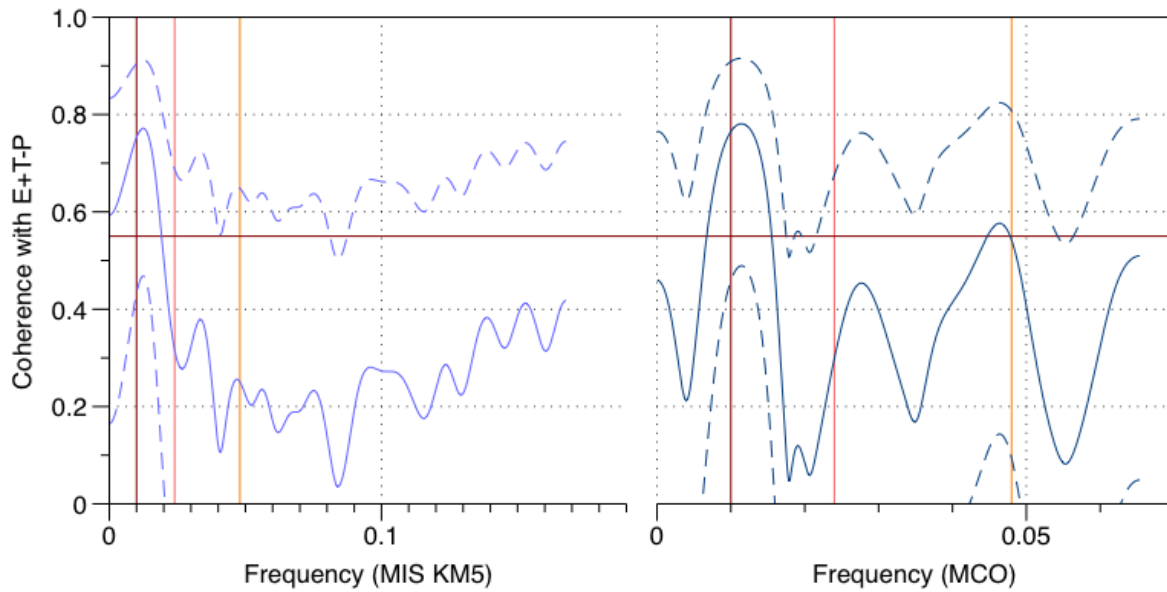


Figure S13: CBT coherence of the small fraction (<32  $\mu\text{m}$ )  $\text{CaCO}_3$  AR with ETP for the Pliocene and the Miocene. The vertical lines correspond (from left to right) to the 100 ka (eccentricity), 41 ka (obliquity) and 21 ka (precession) periodicities, for both the Pliocene and the Miocene. The horizontal line corresponds to the non-zero coherence at a significance level of 90%.

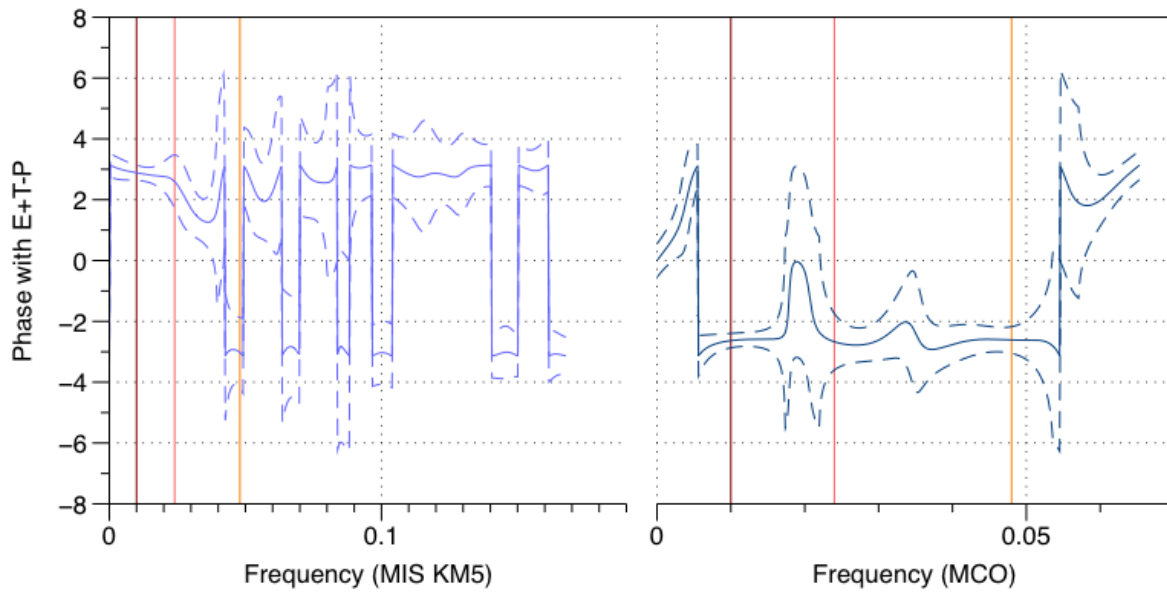


Figure S14: CBT phase of the small fraction ( $<32 \mu\text{m}$ )  $\text{CaCO}_3$  AR with ETP for the Pliocene and the Miocene. The vertical lines correspond (from left to right) to the 100 ka (eccentricity), 41 ka (obliquity) and 21 ka (precession) periodicities, for both the Pliocene and the Miocene.

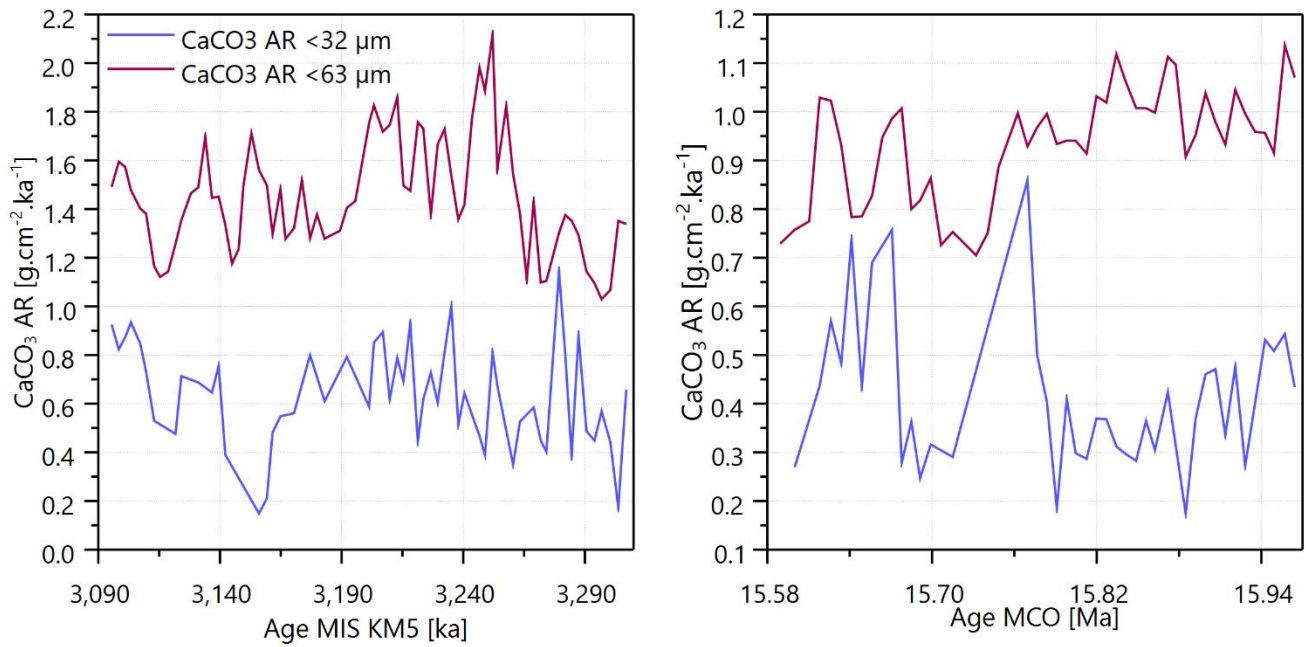


Figure S15:  $\text{CaCO}_3$  AR of the  $<63 \mu\text{m}$  size fraction (red solid line) and  $\text{CaCO}_3$  AR of the  $<32 \mu\text{m}$  size fraction obtained with SYRACO approach (blue solid line) through time both for the Pliocene (MIS KM5) and the Miocene (MCO).