



The oxygen isotope composition in planktic foraminifera shells as recorder of maximum seasonal SST variation

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The oxygen isotopic composition of planktic foraminifera is one of the widest used methods to reconstruct past changes of physical parameters in the upper ocean. The analysis of a mono-specific population is assumed to reflect a mean value of the conditions, e.g. temperature, at a given depth in the water-column and time of the year the species calcified. In this approach a certain amount of specimens is needed to reflect the desired mean conditions and the temperature variability reflected by the selected population remains hidden in the one measured value.

In order to extract the variability of the temperature, i.e. the maximum seasonality, at which a species grows, we separately analyzed 30 to 40 specimens of various species of planktic foraminifera from sediment cores in the Western Arabian Sea off Somalia. Our data set from surface sediments matches the modern amplitude of sea surface temperatures ranging from 16 to 29 °C in this region.

We reconstructed the SST variability for the past 20 kyr on piston core 905P off Somalia and show that during the Last Glacial Maximum seasonality was strongly reduced and ranged from 19 to 26 °C: while the intra-monsoonal period was cooler than today upwelling waters of the SW-monsoon were not as cold as today.