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Climate of the Past Discussions

Interactive comment on "Oxygen isotopic analyses of individual planktic foraminifera species: implications for seasonality in the western Arabian Sea" *by* P. D. Naidu et al.

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Reviewer 2 First time an attempt has been made here to quantify the seasonal changes by using individual species analysis, there is a long way to go to address the issue (of number species required to represent any particular season) raised by the reviewer. 1. Sediment trap sampling in the Arabian Sea clearly demonstrated that G. sacculifer and N. dutetrei are present throughout the year Curry et al., (1992). I agree with the reviewer that G. sacculifer distribution figure is not shown in Curry et al., (1992), however, the Supplementary publication no SUP 18077 contained the data of G. saccfulifer and all other planktonic foraminifera species census data. I agree with the reviewer that

analyses of more number (>50, >100, >1000) of individual specimens would provide better statistical significance than the 20 individuals analyzed here. However, inter shell ïĄď18O variations obtained on 20 individuals of G. sacculifer provide statistically significant standard deviation on which our interpretations are based. Our approach here is to explain the inter shell ïĄď18O variability of G. Sacculifer. Apart from inter annual variability caused by the bioturbation the next valid interpretation would be only seasonality. It is an excellent idea to unravel SST changes during summer and winter monsoons as suggested by the reviewer. But unfortunately we are not able to isolate the planktonic foraminifera species which occurs only Summer monsoon time and winter monsoon time, therefore certainly there are lot of limitations to interpret the seasonal changes in the Arabian Sea. In view of these limitations the inter shell ïĄď18O variability of G. sacculifer is interpreted in the best possible way. 2. As mentioned in the paper large fraction of G. sacculifer and N. dutertrei were chosen in this study in order to avoid the possible ontogenic effect on the inter shell ïĄď18O variability. It is apparently clear based on our unpublished data set and also Elderfield et al (2002) stated "that the largest size appears to be the most reliable and has the least interspecies temperature sensitivity". We are aware the Berger et al (1978) paper wherein he has discussed offsets between different size fractions <200μm hence it may not be relevant in the present context because we have used >500μm size in our analyses. We do not have any idea about larger fraction species live in particular season of the year and smaller fractions during another particular season; our understanding is both large and small fractions species occur throughout the year varying in abundance. 3. Here our focus is to reconstruct the seasonal contrast or ranges in SSS rather than absolute SSS changes, therefore, using of any particular equation would not change the ranges. However, we will try to use Mulitza et al (2003) equation as suggested by the reviewer in the revised version of this paper. 4. As of now it will not be possible to evaluate the extreme events based on the existing data, which is beyond the scope of this paper.

Other minor points: Regarding the accuracy, we have used special micro-inlet system

wherein better reproducibility on a small quantity of sample is achievable (see Niitsuma et al., 1991; cited in the paper). It is highly efficient inlet for the small quantity of carbonate sample analyses. Yes the main focus of this paper is to deal with seasonality hence whole focus has been made on extreme end values. I agree, that a plot on mean values of G. sacculifer and N. dutertrei may provide information on how the depth habitat of these two species varied through time.

Interactive comment on Clim. Past Discuss., 10, 3661, 2014.