Referee and Editor comments. (*responses are in italics*)

The article by Stott et al. has been revised and many points raised by my and the two other referees have been addressed.

Yet I feel with a little more efforts the article could still be substantially improved.

We thank the referee for the careful assessment of the revised version of our manuscript. Below, we respond to the issues raised.

In particular, on the first figures presenting the modern conditions (Figure 1) could really be improved. There are now many tools/ways to provide information on the seasonal/subseasonal SST changes along the year, that could very much help visualize the description you made of the regional settings, that could also have been put in a proper paragraph (and not in the introduction).

We thank the reviewer for this comment. Figure 1 has been substantially redesigned so that it now shows seasonal surface ocean temperature distributions in the Arabian Sea alongside prevailing airflow.

I also admit I still don't see much of a point to work around complex equations for winter vs. summer SST, and would rather opt for having a more straightforward bulloides for winter and ruber for summer, as the fluxes reported in the Conan and Brummer foram flux reference shows that one replaces the other on a 'quasi systematic' way… so I have to say your description of the equations is still obscure to me.

We agree that SST-estimates that are based on a single foraminifera species are a robust tool. In the previous version of the manuscript, we did use single foraminifera based SST's and did not solely rely on our seasonal SST. Having said this, monsoon circulation it the western Arabian Sea is, per definition, highly seasonal. Of the two species we used, only G. bulloides qualifies as an almost seasonal signal carrier given its near exclusive growth during the summer season. This is reflected in the highly similar SST estimates based on G. bulloides and the summer temperatures in figure 4. This figure also shows that the G. bulloides and the G. ruber based SST's show some similarities, but also significant differences. Rather than just discussing both records individually as well as their similarities/differences in a generic seasonal monsoon context, our aim was to go deeper by exploring the seasonal temperature signal using our (we believe) rather novel approach. Given the availability of the data required for the calculations, it would be a missed opportunity to not use these data sets. As with most new techniques, there are uncertainties related to our approach as well, i.e. the lack of data constraining changes in seasonal preference of either species. We have been discussing this in the manuscript. We therefore feel that, whilst not being perfect, the seasonal SST data add an aspect to variability in monsoonal dynamics that would otherwise be missed. In order to ensure not overinterpreting our SST data we have made small corrections to the manuscript,

highlighting when the single specimen-based G. bulloides and G. ruber SST records reflect variability seen in our seasonal SST estimates.

On your figure 6, what would be the summer SST based on G. ruber? Would it increase the matching with alkenones? Or are there other potential mechanisms that could explain why alkenone look warmer than the summer SST derived from you equations?

We are not quite sure what is meant here. Our seasonal SST reconstructions rely on both G. bulloides and G. ruber jointly being used when calculating summer and winter SST's. This entails that we cannot calculate a summer SST just based on G. ruber.

In fact, a multi-proxy comparison of SST reconstructions derived from different tracers is complex enough to discuss a bit more the uncertainties associated with each SST estimate (alkenones, ruber Mg/Ca-based and bulloides Mg/Ca-based) prior to work around with the equations you elaborate in Figure 2. My overall feeling is that the use of the equations to compute winter vs. summer SST is that, in the end, adds more confusion than resolve some uncertainties, as long as a clear comparison/evaluation between modern SST variability (that should be shown somehow in a figure) and the winter vs. summer SST calculation for core tops, which makes me doubtful that the equations used are really adding some values w.r.t. a more basic use of multi-species SST estimates.

In relation to our seasonal temperature approach, please see response to earlier comment. With respect to uncertainties in our SST reconstructions, we are grateful for this comment. We have added a passage in the text and visualized error envelopes for all SST records in figure 4.

Additional editor comments
…"I am puzzled by the 40ka warming, with temperatures above LIG and Holocene values!"

We are grateful for these comments and have noted the 40ka warming as well. We are currently preparing a follow up manuscript that will take our analyses of the SST estimates from core NIOP 929 further, which will include an in-depth assessment of the above-mentioned warming event as well. We would therefore defer a discussion of this event to the envisaged paper.

…"In addition, I do not agree with you that some of your records share similarities with EPICA d18O."

Having now re-read the manuscript, we agree that the statement referring to the relation with AA records was a little to general. We have rephrased the respective section.