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Title: Physical control of the northern Arabian Sea winter chlorophyll bloom interannual variations

Authors: Keerthi et al.

Reviewer's opinion:

The reviewer appreciates the careful revision by the authors, and the extended analysis provided for substantiating their results. I agree that it is important to clarify the mechanisms governing the interannual variability of winter chlorophyll over the productive Arabian Sea region. The manuscript may be considered for publication, but only after some revisions and clarifications.

1. Page 3, Line 8. The manuscript says that "Wiggert et al. (2002) suggested using a simple one-dimensional model, that interannual variations of the bloom intensity were not controlled by interannual MLD variations". Again, I am not sure if Wiggert et al. implied that mixed layer depth variations are not important in controlling the chlorophyll interannual variations (please show me which part of their manuscript implies that). Wiggert et al. study, from my understanding, indicates that diurnal variability of mixed layer is important. It seems to me that the current results are complimenting, and not contradicting Wiggert et al. or Prasanna Kumar et al. (2001)

2. Page 15, Line 18. This section requires revision. The current study is built on the logic that the earlier studies used only a few years of data, which is insufficient to understand the interannual variability of chlorophyll. Meanwhile, the study confidently refers to Goes et al. (2005), which talks about trends in chlorophyll and winds using merely 7 years of data, which is inadequate to extract trends without endpoint sensitivity (Beaulieu et al. 2013). Also, out of these seven years, the first year was an El Niño year, which played a major role in the reduction of chlorophyll concentrations in the Arabian Sea (Murtugudde et al. 1999), and skewing the time series. Besides, several studies (e.g. Roxy et al. 2015) indicate that the monsoon winds are exhibiting a weakening trend, though the changes over the western Arabian Sea are insignificant or uncertain. Using long-term observations and model simulations, a recent study (Roxy et al. 2016) does indicate that the summer chlorophyll concentrations are reducing as a result of stratification due to surface warming. Hence the authors need to update the discussion based on these recent studies.

References:

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Murtugudde, R. G., Signorini, S. R., Christian, J. R., Busalacchi, A. J., McClain, C. R., & Picaut, J. (1999). Ocean color variability of the tropical Indo-Pacific basin observed by SeaWiFS during 1997–1998. *Journal of Geophysical Research: Oceans*, 104(C8), 18351-18366.

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