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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Atmospheric gas-phase composition over the Indian Ocean" *by* Susann Tegtmeier et al.

Anonymous Referee #1

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This paper provides a detailed review of atmospheric gas phase composition over the Indian Ocean. The species includes ozone and pollutants, greenhouse gases and short lived biogenic gases. It is a good update after Lawrence and Lelieveld (2010) and suitable for publication in ACP. However, I have the following suggestions, which may be considered for final version. It is too big to read and goes beyond 'atmospheric gas phase composition'. These extra details such as too much discussion on various meteorological and oceanic processes in Sections 2.1 and 2.2 may be reduced significantly. Similarly, since there is no discussion on the distribution of trace species in oceanic water (it not required also), discussion on salinity, SSTs and productivity may be reduced. Similarly, Sections 6 and 7 may be reduced and merged. Definition of various monsoons and transition periods with months is given in Section 1.2. However,

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Discussion paper

these are not followed in various diagrams starting from Fig.1. Emissions and discussions related to various countries surrounding the Indian Ocean are given at many places in the text. Also, names of various regions are used such as East Asia, Southeast Asia, South Asia etc. However, these is no explanation which are the countries in these regions nor marked in the diagrams. This should be taken care. Percentage changes in various species from the year 2000 to 2015 are given in diagrams and well as in Tables for various regions. The unit for change from 2000 to 2015 in the diagrams is %/yr and the range for all such diagrams is -20 to +20. Whereas in the tables this change is given as total from 2000 to 2015 and the % changes are very high. Please check and clarify if the numbers are ok in the diagrams and suggest to plot as a total change from 2000 to 2015 as in the corresponding tables. Like the INDOEX, there was a JGOFS-India campaign for the Arabian Sea almost in the same period or may be a few years prior to the INDOEX. Detailed measurements of physical, chemical and biological processes were done including the flux measurements of CH4 and N2O in different seasons. These studies, at least the flux part, may also be referred in this work. With developments and related emissions increasing in the African region, a detailed discussion on the transport of pollution over the Indian Ocean from this region and its effect will be desirable. Impact of air pollution transport from the Indian continent over the Indian Ocean has been studied in detail by now. The MS may be accepted for publication after the above suggestions are taken care.

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