

## ***Interactive comment on “Tropospheric ozone maxima observed over the Arabian Sea during the pre-monsoon” by Jia Jia et al.***

### **Anonymous Referee #2**

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#### General Comments:

The authors provide a detailed analysis for the variation of tropospheric ozone over Arabian Sea. They indicated that the maximum of spring time free tropospheric O<sub>3</sub> over AS is mainly driven by long-range transport, particularly, from India. I recommend the paper for publication after consideration of the points below.

#### Specific Comments:

1: Page 2, Line 10-12 It would be better to define the region of Arabian Sea in Figure 1. The enhancement is not very obvious. What is the reason for the 30x10 grid box line in Figure 1?

2: Page 2, Line 13-16 What is the relation between Southern Hemispheric biomass

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burning with enhanced TOC over Arabian Sea? I assume detailed description and citations for Southern Hemispheric biomass burning are not necessary here.

3: Page 2, Line 20-21 If this phenomenon is not unique, but just a “well-known large scale phenomenon”, why should we focus on it?

4: Section 2: Is there any evaluation study for the tropospheric O<sub>3</sub> column provided by SCIAMACHY and OMI/MLS? The TOC is highly depended on the stratosphere-troposphere separation, which could be an issue for the unpolluted area.

5: Section 4 In Figure 3, can you add a panel to show the O<sub>3</sub> variation over northern India? It seems that the O<sub>3</sub> seasonality over AS is strongly correlated with the O<sub>3</sub> seasonality over India (based on Figure 2). Instead of complex source analysis, I am wondering whether the variation of O<sub>3</sub> over AS can be simply explained by the variation of O<sub>3</sub> formation of India.

6: Section 4.3 The local chemistry production in lower troposphere is small (Figure 10), however, I am wondering whether the significant O<sub>3</sub> production in upper troposphere has influences on lower tropospheric O<sub>3</sub>. Does lightning play a role in the O<sub>3</sub> accumulation?

Technical comments:

1: Page 13, Line 11 Change Figure 6.11 to Figure 10

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