

## ***Interactive comment on “OMI air-quality monitoring over the Middle East” by Michael Barkley et al.***

### **Anonymous Referee #2**

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The paper contains a very thorough analysis of some air quality gases in the Middle East. It is scientifically speaking not very new, but it is a very useful overview of the air quality in the region with many details.

#### Comments

Line 160: Scenes with effective cloud fraction > 20 % are rejected for CHOCHO, in line 177-178: a filter for cloud radiance fraction > 0.3 is mentioned for SO<sub>2</sub>, while in line 188 it is mentioned that scenes with a higher than 20% fractional cloud cover are filtered for all data. Why are you not using a single cloud filter setting for all data.

Line 180: Several times in the period of this research volcanoes in North-East Africa have been erupting with as result volcanic plumes over the Middle East region. Large parts of the plume have values of less than 5DU. For example in June 2011 many days

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show remnant SO<sub>2</sub> values caused by the eruption of the Nabro volcano. I would expect this affects the trend considerably and it might be better to remove this period from the time series of SO<sub>2</sub>.

Line 200-201: Does this mean that for the gases HCHO and NO<sub>2</sub> the row anomaly mask in 2013 is less strict than in some earlier years? By using different criteria over the years for these gases your trend is still affected by sampling I would think. Please clarify this section.

Line 224: I think this Figure 2 does not add much to the paper and in my view can be removed.

Line 579: Also for NO<sub>2</sub> a cloud fraction of less than 20% is advised. However, I doubt these advices were given with this particular test in mind. I suggest to apply this test also to CHOCHO and SO<sub>2</sub>.

Line 595-599: I thought the standard analysis was already done for unaffected rows. How are the unaffected rows defined in this particular test ?

Line 622: It is not only the number of observations but also the type. Because you are using a different selection of rows you have a selection of other pixel sizes. The change of pixel size alone will already affect the derived trends. This should be added to the discussion.

Section 5.3: In this section it might be interesting to include the study of Schneider et al. (2015), who did a trend analysis on NO<sub>2</sub> in large urban agglomerations for the period 2002-2012, based on SCIAMACHY.

Figure 3, left-side: In this Figure I have difficulties distinguishing between oil refineries, oil ports or power plants. Other symbols or colors can improve the Figure. Please also add the symbols to the legend.

Table 1-4: In my opinion large part of this table can be moved to the supplementary material.

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In general: the significance in which most values are given is much too high compared to their errors. A digit less is often possible and makes the text better readable.

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