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Interactive comment on “Contrail life cycle and properties from one year of MSG/SEVIRI rapid-scan images” by M. Vázquez-Navarro et al.

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We thank the reviewers for their comments and remarks.

Page 3, lines 166-170. On the discussion of biases caused by strict detection criteria. The strict detection criteria lead to a lower detection efficiency. This also increases, in average, the optical depth of the contrails detected. We acknowledge in Section 2 that the database is biased to "wider and thicker contrails". The effects are discussed under "Summary and Conclusions", but we have moved part of it to Sections 2 and 3, as suggested.

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Page 3, lines 183-184. On the assumption of 10 km altitude for all contrails. The altitude of 10 km assumed for all contrails is a means to locate the MODIS contrails in the SEVIRI grid, not to withdraw any scientific conclusions. The SEVIRI pixels are big enough (especially over the RSS region) and most contrails are correctly located under this assumption. Additionally, ACTA performs a BTD-based search in the vicinity of this *predicted* location, so even if a contrail were placed in a neighbouring pixel due to the wrong altitude assumption, ACTA would initiate the tracking over the *actual* position.

Page 3, lines 200-207. On contrail outbreaks. In the initial MODIS image, contrails must be distinctly apart for CDA to detect them. If, in the MODIS overpass, contrails are distinguishable, they will be treated as single entities by ACTA and tracked until they merge. Unfortunately, clusters cannot be tracked by this version of ACTA.

Page 5, lines 370-374. On the non-similarity with the air-traffic pattern. In the Duda article you mention, CDA was modified by including additional spectral MODIS bands to screen out linear features detected as contrails originally. We had to modify CDA for the same reason as well. As a consequence, we were left with a very low number of contrails. Hence, our distribution does not correlate with air traffic or with the results from Duda. Nevertheless, a slight footprint from air traffic can be observed in several expected regions (Increased coverage: west of the Iberian Peninsula, a corridor to South America, northern part of central Europe, trails over Russia originated by flights to Asia. Low or no coverage: Africa, Arabian Peninsula.) We believe the non-uniformity of the surface over Europe, with its many irregular coastlines difficulting the detection, plays a role in the unexpected decreased coverage over central Europe. The North Atlantic flight corridor is also underrepresented because only contrails that are still linear over the Atlantic can be included in the tracking, not including the linear contrails originating over the US. A longer discussion about the contrail coverage has been

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included in section 3.1. Location.

Page 7, lines 455-457. Thank you for this suggestion. The number of observations has been included, along with some new comments on the results. We believe that the inclusion of average optical depth for all three categories can be misleading. Both the large variability in the dataset and the standard deviations, as high as the average value itself, make the average values less representative than a plot with the actual distribution. However, if the reviewer finds this essential, we would include it.

The technical concerns have been addressed and new plots have been created with the suggested x-axis maxima. A new contrail distribution map has been generated with an increased contrast. The Summary and Conclusions has been shortened a bit by moving part of the discussion on the biases caused by the detection to another section.

Please also note the supplement to this comment:

<http://www.atmos-chem-phys-discuss.net/15/C2686/2015/acpd-15-C2686-2015-supplement.pdf>

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 7019, 2015.

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