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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Detection of ship tracks in ATSR2 satellite imagery" *by* E. Campmany et al.

Anonymous Referee #1

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General comments:

The ship emissions are growing continuously and are least regulated sources of emissions. The ship tracks are the most visible evidence of the influence of ship emissions on clouds. Hence considering their growing relevance in the radiation budget, it is important to quantify the possible impact of ship emissions on clouds. In their study, the authors explore the possibility of using the ATSR2 data to automatically detect the ship tracks. It is very useful to know the spatio-temporal distribution and frequency of ship tracks to be able to accurately quantify their impact on climate. This study certainly takes us one step further in this context. However, the automatic detection of ship tracks in satellite imagery is indeed very difficult task considering how variable the spatial texture of ship tracks can be and also considering how variable its dependence on the state of the atmosphere is. This is reflected in the high rate of false detection mentioned in the present study, which compels me to say that these results should only

be viewed as the feasibility study.

Specific comments:

Few major remarks (not necessarily in the order of importance):

1) It would be very useful if the authors briefly discuss statistics on the ridgelet detection and connectivity attempts. For example, how many ridgelets were detected, and of which, how many were classified as tracks (and eventually called ship tracks) after satisfying connectivity rules in a given scene? Also information on how many tracks were strictly linearly oriented (or curvilinear) might be of interest here.

2) Section 2.2: How sensitive your results are to the chosen pixel spacing (to check the intensity) along the ridge? It would be nice here to give little background information on the width of the ship tracks (although it depends on many factors).

3) Would it be helpful to categorize the detected ship tracks into groups by giving them some kind of weighting based on how closely connectivity rules were adhered to?

4) Have you used albedo in 3.7 micrometer channel in your detection procedure? Would it give better intensity contrast to separate these bright linear features (smaller droplets, higher albedo in 3.7 micrometers)?

5) Section 3.1, last three lines: Would you elaborate on exactly how do you use your validation to normalise the estimated number of tracks?

6) It is bit surprising to see that in spite of high false detection, no ship tracks were detected in the southern hemisphere (esp. southwest coast of Africa). Any comments why?

Minor points:

1) page 14824, line 21: do you mean "distortion" instead of "distorsion"?.

2) Since the algorithm is fully automatic, I would suggest to give title of the paper as

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"Automatic detection of ....".

3) The words "the pixels" are repeatedly used in the paper. However it is not very clear from which channel they are.

A bit different question: Do ship tracks only form in the developing or existing clouds? Can emissions reach high enough to form new linear cloud features? If so, such cases will have strongest contrast to the background and thus easy to detect (but probably more wider). Any comments on this?

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 14819, 2008.

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Interactive Comment