

## ***Interactive comment on “An automatic contrail tracking algorithm” by M. Vazquez-Navarro et al.***

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Received and published: 2 June 2010

The paper presents an updated remote sensing approach to track aircraft contrails over a certain (yet unspecified) fraction of their lifetime. The point is well taken that the method maybe superior to some prior schemes, esp. automated schemes with lower resolution and subjective corrections, in identifying larger portions of the contrail life cycle.

Unfortunately, the reader is left without any perspective of how much of a contrails' life cycle is actually captured by this method, nor is clear what portion of the life cycle has been covered by the previous scheme. I do understand from earlier studies that the underlying remote sensing method used here is not capable of detecting contrails when they are too narrow. Furthermore, contrails may not be detectable when they have lost their initial linear shape or have become too optically thin.

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That said, the statements (p.1440 line 2-3) "track contrails from formation to dissipation of contrail cirrus" and (p.1459, l.14-15, Conclusions) "the new algorithm identifies contrails and contrail cirrus over a substantial part of their lifetime" do not live up to their promise. It seems vital that such claims be supported and quantified. Without proper quantification, these and similar assertions (p.1440, l.19; p.1441, l. 22; p.1442, l. 15; p.1449, l.4+5; p.1460, l.15-21) are moot. Quantifying this issue might make the new method more useful for further studies.

Other issues that require clarification include:

p.1440, line 16

The term *aircraft-induced cloudiness* is not used according to its IPCC definition.

p.1440, line 20 *young contrails are easy to identify*

How shall the reader interpret the term *easy* in that statement? There are a number of false alarm issues in detecting line-shaped contrails passively from space-borne sensors.

It may (or may not) be true that contrails remain linear, but unless the authors convincingly demonstrate that the tracked, short segments can safely be identified by the remote sensing method (in terms of width, optical depth, and other detectability parameters such as underlying surface or nearby cloud), the assertion (p.1442, lines 19ff) is not useful as an argument in support of the tracking method and affects the discussion in Sect.2, which heavily relies on the tracking of the linear segments.

p.1449, lines 1+2

Contrail age and linearity are not necessarily connected.

Relating to the life cycle issue from above: How long and wide are the contrail line segments mentioned in Sect.2.1? What about false alarms? I suppose contrails merging into a thin cirrus cloud system or simply older strongly spreading contrails cannot be tracked for a long time with the method, even if the previous history of contrail

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evolution was known. What would happen if a tracked contrail or contrail segment is concealed/obscured by a cloud underneath or above or becomes optically too thin to be detected for a little while? What is the estimated optical depth detection threshold for contrails inherent in the applied method?

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Interactive comment on Atmos. Meas. Tech. Discuss., 3, 1439, 2010.

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