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Atmospheric Measurement Techniques Discussions

Interactive comment on "Correcting orbital drift signal in the time series of AVHRR derived convective cloud fraction using rotated empirical orthogonal function" *by* A. Devasthale et al.

Anonymous Referee #3

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General remarks: The authors deal with a basic topic which is handled very compendiously. I suggest further data analysis to be finally more conclusive.

Remarks on section 2 (Data and methodology): Many details are missing in order to follow the logic. The methods of EOF and REOF condignly have to be specified and explained or at least advantages and disadvantages of both methods should be discussed.

Remarks on section 3 (Results of the REOF analysis): I am not convinced that the REOFs shown in figure 1 disentangle the orbital drift signals better than the first EOF

modes. The correlation for REOF modes 1 and 3 is higher than for the EOF modes 1 and 3. The second REOF mode seems to be slightly lower than the second EOF mode. On the contrary mode 4 shows reduced correlation. This needs more explanation. Moreover, I am interested to see results for clouds with BT<230 K and BT<240 K. What are the differences? Please indicate in captions of figures 1, 2, 3 and 4 which years were analyzed (2001-2006?). Definitely the frequency distribution of the cloud fraction shown in figure 5 reveals agreement between MODIS and corrected AVHRR data. The result is a requisite. In my opinion this alone is not sufficient for the conclusions presented. A detailed comparison of cloud brightness temperature is needed. Statistical analysis (not just basic statistics) could prove that the new AVHRR results significantly agree with MODIS data or not. Frequency distributions as in figure 5 should be compared for cloud brightness temperature (different years might give important hints if the correction procedure works out).

Remarks on section 4 (Conclusions and discussions): The technical issue of the work is the removal of orbital drift signal in 'Nearly 30 yr of data from the Advanced Very High Resolution Radiometers (AVHRRs) onboard the National Oceanic and Atmospheric Administration (NOAA) satellite series'. In the manuscript a more detailed discussion is just presented for 2006. Why? The comparison with MODIS data for other years, specification of the orbital drift and overpass times (2001-2006) is inevitable. I would like to see much deeper discussion with regard to such an important issue.

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