

## ***Interactive comment on “Temporal co-registration for TROPOMI cloud clearing” by I. Genkova et al.***

### **Anonymous Referee #1**

Received and published: 7 November 2011

The study under review investigates the maximum allowable temporal mismatch between two satellite measurements. The first satellite generates a cloud screening mask that is used by the second one (Sentinel-5 precursor with its TROPOMI instrument) aiming at trace gas or aerosol retrievals. While the topic is of general interest for the planning of future satellite missions and thus of interest to AMT, the presented material is rather thin. I encourage the authors to consider the comments below to substantiate their findings.

#### Comments

1. The manuscript highlights several times that the study is triggered by the need for a reliable cloud mask when aiming at methane (sometimes "methane and aerosol") retrievals. Unfortunately, there is no effort to quantitatively relate methane retrieval

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errors to residual cloud contamination. The cloud screening requirements should be based on methane error estimates but they are arbitrarily assumed 2% and 1%.

2. There is substantial differences between the maximum allowable temporal mismatch derived from SEVIRI 15-min and GOES-10 1-min data. This questions the general applicability of the conclusions.

- The sensitivity studies CASE A, B, C might hint at the conclusions actually depending on sensor resolution.

- The study only addresses mid-latitudes. Do the conclusions depend on the region chosen? What about the tropics?

- GOES-10 1-min data cover only a single day. I would doubt that general conclusions can be derived from this sparse dataset.

The study should investigate to what extent the conclusions are dependant on sensor resolution, choice of the region, sparseness of the dataset.

3. Are the cloud detection algorithms able to identify cirrus clouds of small optical thickness? The latter substantially affect methane retrievals in the SWIR spectral range and thus, cirrus screening would be important.

#### Technical comments:

p.6250,l.8: "on a pixel basis": It might not be obvious to the non-expert reader what the term "pixel" refers to. Replace by eg. "at the resolution of individual soundings".

p.6250,l.12;p.6252,l.7;p.6252,l.16: "S-5P" vs. "S5P": several redundant definitions

p.6250,l.21: "AVHRR": define acronym.

p.6251,l.25ff: Please provide references.

p.6252,l.6ff: Some sentences are 1-to-1 copied from the abstract. This is to be avoided. Given that the abstract is lengthy anyway, shorten the abstract.

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p.6254,l.25: 2006 year -> year 2006

p.6254,l.27: quantified -?> categorized

p.6255,l.1,l.2: remove "derivation", remove "worth".

p.6255,l.20: channels -> channel

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Interactive comment on Atmos. Meas. Tech. Discuss., 4, 6249, 2011.

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