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Interactive comment on "Retrieval of temperature profiles from CHAMP for climate monitoring: intercomparison with Envisat MIPAS and GOMOS and different atmospheric analyses" *by* A. Gobiet et al.

J. Wickert

jens.wickert@gfz-potsdam.de

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Comment on the paper "Retrieval of temperature profiles from CHAMP for climate monitoring: Intercomparison with Envisat MIPAS and GOMOS and different atmospheric analyses" by Gobiet et al. in ACP

By Jens Wickert (GFZ Potsdam, wickert@gfz-potsdam.de)

The authors used CHAMP GPS radio occultation retrievals from the operational processing at GFZ, however did not include this center in their study or discussed their

results with these colleagues. This unfortunately led to several incorrect assumptions and conclusions, which I try to summarize here in brief.

It is unclear, why the GFZ retrievals (version 005) were used in this study. At EGU 2006 (April 2006, before submission of this paper) were results of an improved version of GFZ retrievals presented [Wickert et al., 2006]. The difference of both versions (new - 005) is around +2.5 K at 35 km and around +1.5K at 30 km for a global data set of around 7.000 profiles, recorded between Jan. 12 Feb. 21, 2006. These deviations are in the same dimension of the reported deviations between the data set (CCR) and the 005 retrievals, consequently all statements related to the discussion of the differences are questionable, since the initialisation scheme was not modified, but a numerical incorrectness led to the reported behaviour of the 005 profiles. This was found already in previous comparison studies.

At least one co-author of the paper under discussiom here was present in the audience of this talk. The related talk and corresponding plots can be provided on demand.

The CCR uses ECMWF data for the bending angle initialisation, this should be focussed more clearly. Consequently already data at the bending angle processing level (and the refractivity and also temperatures) are influenced by ECMWF. This is not the case for the GFZ retrievals (for bending angles and refractivity).

But it also must be stated clearly, that the temperatures at upper altitudes (above 25 km) based on the dry temperature retrieval (used by GFZ) can be significantly influenced by the initialisation scheme. However this was reported already in previous studys [e.g., Hajj et al., 2004] and is no new scientific result.

The focus of the retrieval at GFZ is on bending angles and refractivity profiles. These data can be regarded as more independent (from external information) observables compared to the temperatures. E.g. bending angles and refractivity data are assimilated for numerical weather forecasts, not temperatures. The GFZ processing also includes bending angle and refractivity data in the lower troposphere (below 10 km)

ACPD

7, S330–S332, 2007

derived using advanced wave optics based algorithms. The used (quite straightforward) initialisation scheme for the operational GFZ processing was selected based on practical reasons and personnel limitations.

It also must be noted that differences between GPS RO retrievals of different processing centers were observed already in earlier studies [e.g., Ao et al., 2003] and are of interest for current investigations. To ensure the scientific value of such comparisons it should be a matter of course to involve the processing centers.

I strongly recommend to exclude GFZ profiles version 005 from this study. The drawn conclusions related to the temperature deviations are scientifically not justified.

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