

Interactive comment on “GPS radio occultation with CHAMP: monitoring of climate change parameters” by T. Schmidt et al.

T. Schmidt et al.

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Dear Referee 1,

thank you for the helpful and useful comments and suggestions.

Before we give a detailed response to the comments we give a general remark: In the originally version the paper combines updated results of an earlier study on the tropical tropopause layer and QBO (Section 3) and introduces new results from a 1DVAR retrieval for water vapour in the middle and lower troposphere (Section 4). Referee 1 has accepted this with minor corrections, especially for the 1DVAR retrieval and a remark that the results in Section 3 are not very new. Mostly from the critics of Referee 2 we have decided to submit a completely revised version. The main changes are:

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(1) The title: "GPS radio occultation with CHAMP and SAC-C: global monitoring of thermal tropopause parameters"

(2) The study is extended to the global lapse-rate tropopause (LRT) based on the CHAMP data from May 2001-December 2004 and SAC-C data (August 2001-October 2001, March 2002-November 2002). Global differences are discussed with respect to seasonal changes of the LRT pressure, temperature, potential temperature, and LRT sharpness.

(3) The LRT altitude, pressure and temperature results are compared with operational ECMWF and radiosonde data.

(4) Section 4 of the current version (1DVAR retrieval for water vapour in the troposphere) will be removed because these results concerning the middle and lower troposphere and therefore are not a topic for COST 723. We follow here the suggestion of Referee 2.

In the following we respond to the comments. Because we have removed the section about the 1DVAR retrieval we do not answer and discuss the related points.

General Comments

Point 2:

The remark regarding new results was taken into account. In the revised version we discuss in addition to other tropopause climatologies seasonal differences of LRT parameters and present a global picture of the tropopause sharpness.

Specific Comments

Section 3.1:

Done in the revised version.

Section 3.2:

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Done in the revised version.

All other comments are related to the 1DVAR retrieval and will not be considered here.

ACPD

4, S3672–S3674, 2004

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