

## ***Interactive comment on “Some experimental constraints for spectral parameters used in the Warner and McIntyre gravity wave parameterization scheme” by M. Ern et al.***

**M. Ern et al.**

Received and published: 1 August 2006

The authors would like to thank Anonymous Referee 2 for his/her comments that will greatly help to remove some inaccuracies. As a consequence the legibility of the manuscript will improve significantly.

In the following we will address to the specific comments:

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**(1) Referee Comment: It could be stated more explicitly that the calculations presented employ  $\beta=0.1$ , no calculations for higher beta are presented!**

Reply to Referee Comment (1):

This comment is similar to Referee Comment (2) of Anonymous Referee #1, showing the importance of this point. As reply to Comment (2) of Anonymous Referee #1 we will add the following sentences after pg. 4774, line 8:

"In the Warner and McIntyre scheme the parameter  $\beta$  (see also Sect. 1) is proportional to the values of GW-MF as well as to the values of GW drag. Therefore scaling of GW-MF and GW drag with  $\beta$  as suggested in Sect. 4.3.2 can be used to reduce the low-bias of model GW-MF without changing the relative distributions of GW-MF and GW drag. This means the correlation between modeled GW-MF and CRISTA GW-MF as reference is left unchanged and also the ranges of launch parameters determined from the correlation criterion. Indeed, increasing of  $\beta$  makes sense because for the CRISTA-2 case..."

In addition, we will change the paragraph in the introduction where  $\beta$  is introduced (pg. 4758, lines 19ff) as follows:

"From theoretical assumptions the value of  $\beta$  is about 0.1 with an uncertainty of about a factor of two (...). Since  $\beta$  in the way it is used in the Warner and McIntyre GW parameterization scheme simply scales the values of GW-MF and gravity wave drag without changing relative structures of the overall distributions this value of  $\beta$  will be used for all calculations shown in this manuscript (see Sections 3, 4 and 5)."

And also where the calculations with the Warner and McIntyre scheme are introduced in Sect. 3 (pg. 4762, line 14) we will add the following sentence:

"...is chosen (...). It should be mentioned that we always use the standard value  $\beta \approx 0.1$  without loss of generality since  $\beta$  in the Warner and McIntyre GW parameterization scheme simply scales the GW-MF values without changing the relative distributions (see Sect. 1). Using higher launch levels..."

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**(2) Referee Comment: In Fig. 3 the contour labels are hard to see, no indication of the units of the contour labels is given in the caption!**

Reply to Referee Comment (2):

This point is also partly addressed by Anonymous Referee #1, Comment (7). Therefore we will add individual color bars for each panel in Figs. 3 and 4 displaying the contour intervals. The units used in the different panels are indicated in the figure captions, however, it is not stated clearly that those units apply to the contour levels. Therefore we will rewrite the captions of Figs. 3 and 4 as follows:

For Fig. 3:

"Shown are horizontal distributions of GW-MF in mPa (see color bars and contour labels) for CRISTA-2 (August 1997) at altitudes ..."

For Fig. 4:

"Shown are horizontal distributions of GW-MF in mPa (see color bars and contour labels) for CRISTA-1 (November 1994) at altitudes ..."

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**(3) Referee Comment: What does "inevitable" mean in the last sentence of the abstract?**

Reply to Referee Comment (3):

The word "inevitable" should underline the statement that our current study shows that it is not enough to optimize the global set of model launch parameters to match the measured distributions of GW momentum flux in all details. To achieve this it would be necessary to provide spatial and seasonal variations of the launch parameters for the

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whole globe. Maybe the formulation we used in our abstract is somewhat misleading. We therefore will rewrite the last sentence of the abstract as follows:

"... in the unsaturated part. However, even with this optimized set of global launch parameters not all features of the measurements are matched. This indicates that for further improvement spatial and seasonal variations of the launch parameters should be included in GW parameterization schemes."

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Interactive comment on Atmos. Chem. Phys. Discuss., 6, 4755, 2006.

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