Dear reviewer #2,

we thank you for the comments and suggestions to improve the manuscript. Below we give some reply of the raised points, and will carefully consider all of them in the revised manuscript.

The authors should include a table summarizing the different experiments.

We agree with the referee. Owing to the huge amount of different experiments it would be better to summarize them in a table. This table may include the position as well as the different GW forcings in the respective region, e.g. as in Table 1 below.

Simulation	Abbreviation	Region	Max. zonal GW drag ($ms^{-1}day^{-1}$)	Mean zonal GW drag ($ms^{-1}day^{-1}$)	Max. meridional GW drag ($ms^{-1}day^{-1}$)	Mean merdidional GW drag ($ms^{-1}day^{-1}$)	Max. heating by GWs ($Kday^{-1}$)	Mean heating by GWs ($Kday^{-1}$)
Reference	Ref		-0.025/0.02	0.003	-0.025/0.01	-0.001	-0.0006/0.01	0.0003
Hotspot	H1-H8	27.5-87.5°N 118.1-174.3°E 18-30km	-10	-10	-0.1	-0.1	0.05	0.05
Gauss	Gauss		-13.1		-0.13		0.065	

Table 1: Overview of the mean and maximum values of the zonal and meridional GW drag and heating by GWs for the reference and hotspot simulations as three dimensional box and as Gaussian distribution. The mean and maximum values refer to the region (118.1-174.3°E, 18-30km and the respective latitude range) of the hotspot.

The reviewer found it a bit confusing that the Gaussian GW hotspot is shown in Figure 2 and the comparison between the 'used' simulations and the Gaussian is later presented in Figure 8. It is suggested to present this type of sensitivity in the experimental description section and later just refer to the 'main' model experiments.

We agree that it might be a bit confusing. However, to evaluate the possible effect of a Gaussian distribution we first have to analyze at least the differences of the three-dimensional box H3 GW hotspot and the Ref simulation. We will add more explanations to the description of Figure 2 and the new Table 1, and clearly state that we will come back to the Gaussian-shaped hotspot later.

Please clarify whether the altitudes shown in the Figures correspond to the pressure grid or whether the altitudes are computed from the geopotential and converted into a geometric altitude. This simplifies some comparisons to observations results.

The altitude, which is shown or chosen in all figures is given in logarithmic pressure height. It is defined by:

$$z = -Hln\left(\frac{p}{p_0}\right)$$

z . . . . . .logarithmic pressure height
H = 7 km . . . . . scale height
p . . . . . .pressure at specific level
p_0 = 1000 hPa . . . . . .reference pressure

The logarithmic pressure height corresponds to the geometrical height up to an altitude of about 110 km with small deviations increasing within the altitude range. In 110 km the deviation is about 5 km. Depending on the thermospheric temperature the logarithmic pressure height can strongly differ from the geometrical height. Because we are just interested in altitudes up to 80 km, it can be assumed that the given altitude is close to the geometric height. We will add an explanation in section 2: "Note that depending on the temperature profile the used logarithmic pressure height can differ from the geometric heights. However, at altitudes below 80 km, this difference is negligibly small."

Another comment of the reviewer concerns the implementation of the GW drag for the different latitudes. As the drag scales also with the atmospheric air mass that is affected by the drag, it might be mentioned that at higher latitudes essentially less drag is exerted to the atmosphere as the GW drag volume scales with latitude. Or with other words the atmospheric mass that is affected by the drag decreases with latitude. This might need some more discussion or should at least be mentioned in the interpretation of the results.

The reviewer is right, the integrated drag scales with the cosine of latitude. This is, however, necessary, because otherwise the drag, both locally and as a zonal mean, would strongly increase with latitude. But in the governing equations such as e.g. the continuity equation the horizontal winds are scaled as well, so that this would result in a different experiment. We will add a note on this in section 2.

Some Figures (3,4,6 and 7) need an improvement of the quality.

We will provide them in higher resolution.

Page 3: line 18: . . .vertical resolution 2842 km should be 2842 m

We will correct that.