

ACP review:

This is a point to point response to the **Ref#2** comments.
Referee comments are in italic.

We would like to thank the referee for his detailed insight into the intermittency of GWs and the relevance of our GWD enhancement.

I support the comment of Referee#3 that for fully appreciating the results, it is necessary to assess the variability of the model and the influence of this on the results.

Answer: The variability of the model is now better described and all of the mean plots now come with an estimate of statistical significance. Please see the response to Ref#3.

Both the authors and Referee#3 emphasize the intermittency of gravity waves. The quoted intermittency investigations focus on the high variability considering single waves / individual observations. This intermittency may be used for instance to develop / improve GW parametrization schemes (de la Camera et al., JGR, 2014). The situation is different, however, if we consider regional averages. Regional averages for regions with prominent mountain wave forcing also yield highly intermittent GW vari- ances and GWMF, with variations of more than an order of magnitude from day to day (e.g. Eckermann and Preusse, 1999, Jiang et al., JGR, 2002, Schroeder et al., GRL, 2009). The situation is different, for instance, for subtropical convective gravity waves (i.e. summer subtropics). Considering single wave events, there is also large intermittency between events. GWMF and also other wave parameters (phase speed, wavelengths) are highly variable. Considering a larger region as in the current paper, the average behavior however does vary much less (e.g. Schroeder et al., GRL, 2009). For the wintertime forcing discussed here, shear would be a likely source (e.g. Leena et al., JASTP, 2012; Pramitha et al., ACP, 2015; Atmos. Res. 2016). Unfortunately, we have for this forcing a lack of sufficiently frequent remote sensing observations (i.e. in- sufficient temporal resolution), in order to quantify the temporal variability, but it may be argued that also the winter time regional average would not lead to strong pulses (i.e. day-to-day variations). Thus, assuming a constant forcing after the onset of some gen- eral meteorological condition, seems a plausible assumption and therefore focussing on the average response after a few days a plausible approach.

Answer: Based on your comment we are discussing this at P15L33-35 and the reference Schroeder et al., 2009 is added.