We thank the Editor for the feedback on the paper. Below are our responses and details of how the manuscript has been changed in response.

Comments from editor

Many thanks for submitting the revised version of your manuscript. I find it interesting and suitable for publication in ACP, subject to a few revisions, as indicated below:

- abstract: I think that the fact that you used a nudging above a certain altitude is quite important and explains some of the good agreement of your simulation with observations. I therefore indicate already in the abstract that the simulations have been performed with nudging (except for the lowest ... km.

This information has been added to the abstract.

- p. 3 line 12: "Vaughan et al. (2003) estimated ...", and in several other places: use past tense when referrring to published papers (as you do it, e.g., on p. 4 line 24).

Done.

- p. 4 line 4: references should be in chronological order.

Done

- section 2.2: what about the parameterization of convection? I assume that deep convection (which scheme?) is parameterized in the coarser simulations, but not in the 2 km run. What about shallow convection?

The two lowest resolution nests used the Kain-Fritsch convection scheme, which parameterizes deep and shallow convection, whereas the inner nest did not use a convection parameterization. This information has been added to the text.

- p. 7 line 27: please specify whether you used operational analysis data or reanalysis data.

It was operational analysis – this has been added to the text.

- section 3.1 and thereafter: time/date indications could be slightly shorter, e.g., just "at 1200 UTC 5 January".
- p. 11 line 4: use consistently the format XXXX UTC 06 Jan.

The date format has been made consistent.

- p. 11 line 10: I don't understand what you mean by "latent heating through precipitation removal".

This has been changed to "latent heating through condensation followed by precipitation removal". I.e. the condensed water has been removed so that it cannot evaporate again upon descent. This is explained in the previous paragraph of the text.

- p. 24 line 2: delete "the" before "to allow".

Done

- a critical question about the nudging: I think it is likely that the high-resolution simulations produce gravity wave signals that are not fully represented by the ECMWF analyses used for the nudging. What happens then, if the gravity waves propagate into the layer where the nuding is active? Is the nuding the "killing" then gravity wave, and maybe even spuriously reflecting the wave?

This is difficult to answer definitively, but it seems likely that the nudging would not have a major effect on the upward propagating gravity waves in the high resolution nest because the relaxation timescale for the nudging is almost an hour. This long timescale allows the model to resolve features fairly independently with only a weak forcing applied due to nudging, which is likely to be akin to that which might occur naturally during changing meteorological conditions. The response of the atmosphere to the gravity wave disturbance is likely to take place much more quickly. Also, the fact that the model produced a breaking gravity wave region at roughly the same place as was observed by the aircraft gives confidence that the nudging is not producing unrealistic effects such as a killing of the gravity wave or spurious reflections.

- p. 27 line 9: should read "in contrast to our case".

Done.

- p. 27: here you discuss the issue of resolution for generating foehn flows. What about your coarser resolution simulations: for instance, does your intermediate simulation produce a similar foehn as you highest resolution simulation? It might be useful to mention this briefly in the paper (and not only refer to Orr et al. for a coarser resolution run).

We have examined the 30km resolution run and found that warm air descent is produced even there. This has been described in the paper along with the possibility that vertical resolution differences may also have been important here:-

of time dependent behaviour. Although, one key difference between the two simulations is that the horizontal resolution used in Orr et al. (2008) was 12 km, compared to the 1.875 km used in our study. This could conceivably have have led to poorly represented gravity waves in the latter, which in our study had a horizontal wavelength of around 60 km and were shown to have been vital for the lee flow development. However, examination of the lowest resolution (30 km) nest from our simulation reveals that warm air descent onto the Larsen Ice Shelf does occur despite the resolution being much lower than that in Orr et al. (2008). One other possibility is that the vertical resolution is also important; our simulation used 81 vertical levels whilst that of Orr et al. (2008) used only 38. Vertical resolution is likely to be important for correctly capturing the rapid changes in stratification with height that are known to be important for lee flow developement. Recent 1.5 km resolution simulations presented in Elvidge et al. (2014) also showed the occurrence of föhn flow in blocked upwind conditions, which corroborates our results.