

Interactive comment on “Gravity wave influence on NLC: experimental results from ALOMAR, 69° N” by H. Wilms et al.

Anonymous Referee #3

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General Comment

This study by Wilms et al. investigates the influence of gravity waves on noctilucent cloud (NLC) occurrences from 12 years of observations over ALOMAR. Gravity waves are observed in the same altitude range as the NLC's by using wind data from an MF radar along with lidar observations of NLC's, which is an improvement over previous studies from other observing sites, which compared NLC occurrences with stratospheric gravity wave activity and have presented conflicting results on the relationship between the two. Over Alomar, the authors find no significant correlations of NLC occurrence with short and long period gravity waves, except for one year where a positive correlation is found for long period waves which agrees with model studies. The paper is well written, the data is presented very clearly and suitable for publication in ACP.

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I offer only the following specific comments for consideration by the authors in their revision of the manuscript.

Specific Comments

1. In Figure 1(b), I recommend changing the X-axis scale also to logarithmic so it does not confuse the reader. The reference variance also includes the semi-diurnal tide (and possibly a terdiurnal) peak. How does this affect the analysis? This should be discussed in the text.

2. It would be interesting to see a figure similar to figure 5 and 9 for brighter NLC. (Applying a threshold of $\beta_{\max} > 10, 15$ and $20 \text{ e-}10$). Chandran et al. 2012 discusses the brighter clouds seen in CIPS as possibly being driven by long period gravity waves.

3. The NLC observations are, I presume, averaged over the whole NLC season. However it would be worthwhile to split the NLC season into three epochs, start, peak (around solstice) and end season and see if there is any difference in the observed relation between gravity waves and NLC's at different phases during the NLC season.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 20049, 2013.