Atmos. Chem. Phys. Discuss., 13, C5689–C5691, 2013
www.atmos-chem-phys-discuss.net/13/C5689/2013/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Quantification of waves in lidar observations of noctilucent clouds at scales from seconds to minutes" *by* N. Kaifler et al.

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Received and published: 9 August 2013

Regarding the spline interpolation before the wavelet transform:

We have redone the analysis without spline subtraction and also using a FFT algorithm. The result is given in the revised manuscript (Tab. 1). We added (Page 7406, Line 18): "To test the robustness of the results we performed the spectral analysis also without spline-subtraction and also using a FFT algorithm. The results of all three methods agree and lie within the error bars given."

p. 7398, l. 20: We have removed the term "In summer,".

p. 7399, l. 7: We found that both forms (high/low and warm/cold for atmospheric temperature) are common among native English speaking scientists and rephrased to "... in the cold summer temperatures...".

p. 7400, l. 24: We have moved the term "acquired in 2011" in the sentence to make clear that the single-pulse detection system was acquired in 2011. The data shown is from 2011, too.

p. 7401, l. 10: We have changed the phrase to: "the measurement volume is expanded to 1.3 km in the direction of wind speed"

p. 7401, l. 19: Although data is sampled "per time and altitude bin" as suggested, the value \beta(z,t) is independent of the bin width. We have rephrased the sentence to "per time (t) and altitude (z)".

Page 7402, line 19: suggesting word "quantification": Yes, thank you, we changed the manuscript accordingly.

p. 7404, l. 1: The results from the datasets of each telescope were similar (7.82 and 7.92 %). We have rephrased the sentence.

p. 7404, l. 23: We meant clear wave-motions like e.g. idealized sine wave compared to random motions. We removed this wording as it seems to be misleading and is not essential for the text.

p. 7405, l. 21, l. 22: The same numbers are given in units of km/h and m/s for convenience. We've added a \widehat{=} to make this clear. Also in p. 7410, l.17.

p. 7406, l. 19: We have included a short explanation of locally and globally significant periods in the revised text: "we identified locally (at certain times) and globally (throughout the whole observation period) significant..."

p. 7406, l. 21: This test with the random time series was used to determine the resolution limit of the wavelet transform. We have changed the text to "accidentially

appear significant“.

p. 7410, l. 21 and 23: The estimated change in temperature can be positive or negative, as air is transported up or down depending on the phase of the wave. This results in a positive and negative growth rate: Increase in temperature will increase the particle size, decrease in temperature will decrease the particle size. The dependence however is not symmetric, hence two different values are obtained.

p. 7411, l. 2 The standard small particle approximation is r^5 to r^6 (Baumgarten-JGR2008).

p. 7427, fig. 7: The grey-shaded area masks periods which we do not consider because of resolution limits of the wavelet transform. This is mentioned in the text, where we have added a reference to the grey-shaded area.

The language corrections suggested are corrected in the revised manuscript, thank you very much.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 7397, 2013.