This manuscript presents a standardized definition for the computation of temperature uncertainty budget in NDACC Rayleigh temperature lidars. The main objective of these lidars is to provide high quality data for the long term monitoring of middle atmospheric temperature. This requires a very good characterization of the error budget and the possibility to intercompare the results obtained with the different instruments of the network. Up to now no effort has been made to homogenise the procedures applied for the determination of individual uncertainty components and their propagation in the data processing chain of lidar algorithms. This paper represents a very valuable contribution to the improvement of the data quality of NDACC temperature lidars. It will be worth for publication in AMT after taking into account the remarks detailed below.

1) I suggest indicating since the beginning of section 3 the assumptions made in the measurement model. This will make the reading of the paper easier. For instance the assumption that the lidar is operated in photon counting mode appears only page 6, line 33and the assumption of a full overlap between the laser beam and the telescope field of view appears only page 7, line 25. It is implicitly assumed in the equations that the laser beam is fully vertical. It has to be explicitly said in the text.

2) Filtering process: It is indicated in the abstract that covariance terms must be taken into account when vertical filtering is applied but the propagation of uncertainties during the vertical filtering process is not presented in the text. I assume that it consists in a linear summation for systematic errors and quadratic summation for random errors but it has to be described for the full consistency of the paper.

3) Equation (18), page 6: when the vertical filtering is applied to the temperature, it has to be made on the inverse of temperature. This is due to the fact that density and temperature are anticorrelated at small vertical scales as shown in equation (13) where *N(k)* appears in the denominator of the expression giving T(k). If the filtering is applied to *T(k),* Symmetrical fluctuations in *N(k)* due to the random photon noise will induce asymmetric perturbations in T(k) and a warm bias in the smoothed temperature profile.

4) Equation (23 for $U_{S(DET)}(k)$ is not correct. It does not take into account the correlation between two consecutive terms $U_{\bar{N}(DET)}(k')$ and $U_{\bar{N}(DET)}(k'+1)$ coming from equation (22). Both terms are depending on $U_{N(DET)}(k'+1)$. Assuming that *N(k')* and *N(k'+1)* are about equal, the uncertainty in $U_{S(DET)}(k)$ is underestimated by a factor $\sqrt{2}$ by equation (23). This equation has to be corrected to take into account the correlation between two consecutive terms.

Typing errors:
Page 19, line 11, some reference is missing as indicated by the message *"Error! Reference source not found"*.

Page 22, line 8: *".... is compiled in Table."* 2 is missing