We would like to thank the reviewer for taking the time to assess our manuscript. In the following paragraphs, we will address all of the reviewer's comments.

This study concerns the quantification of the mesospheric impact of the Pinatubo eruption using the HALOE instrument on board UARS platform.

While these series miss the beginning of the event, it is interesting to perform such analyses because Pinatubo is one of the biggest eruptions observed in the last decades that has perturbed the whole atmosphere.

This analysis confirms previous analyses that have indicated a warming of the mesosphere following the eruption and deserve to be published. However, I think the amplitude estimates provide in this study needs to be carefully discussed while this study do not provide any uncertainties.

Thank you very much for this comment. To address this, uncertainties for the regression coefficients were calculated by averaging the distance between the true regression coefficient (using the full time series) and the upper and lower boundary of the 95% confidence interval calculated from the delete-1 jackknife method. The uncertainties were added to the reported regression coefficients and a short sentence explaining the procedure was included from line 106-107: "The uncertainties for the regression coefficients are reported as the average distance from the regression coefficient to the upper and lower boundary of the 95 % confidence interval from the jackknife method."

The conclusion that there is a discrepancy with previous studies seems then to be too strong. The conclusion should be more positive while warming was confirmed.

We agree with the reviewers opinion, that the manuscript should also highlight the aspects that are in agreement with the study of She et al. (1998) that we cite. We added to our discussion, line 185-186: "Our HALOE study supported previous observations of an episodic warming in the upper mesosphere that might be related to the Pinatubo eruption in 1991. " and included additional sentences to our conclusion from line 260-263: "A maximum positive amplitude of 3.08 ± 0.26 K was observed and supported the finding of the previous study that a temporary warming seemed to occur in the upper mesosphere region after the Pinatubo eruption. Our estimated temperature signal, however, seems to be lower than the one reported by She et al. (1998)."

The volcanic eruptions are complex to quantify while solar cycles match the occurrence of volcanic eruptions mainly when series are short (see for example Kerzenmacher et al., 2006).

We thank the reviewer for drawing our attention to the publication of Kerzenmacher et al. (2006). We added this citation to our discussion about the problem of separating the volcanic from the solar contributions to the mesospheric temperature in line 210.

Temperature deviations associated with Pinatubo eruptions are calculated with zonal average while other estimates are local observations. Also some estimates are performed by season and some other including all season. If a dynamical effect is expected, Pinatubo signature should be different.

We agree with the reviewer and added the following sentence to the discussion from line 200 -202: "It has to be pointed out that the results published in the literature vary in the spatial range that is discussed (zonally averaged results compared to local ground-based measurements) and that some only focus on a specific season while others do not make such a separation."

Also data quality needs to be discussed either the absolute values (see Remsberg et al., 2002) and the number of data while solar occultations provide a smaller sampling than more traditional observation like nadir observations while the vertical resolution is better.

In order to help with the comparison of the results from the satellite-borne HALOE and the ground-based lidar instrument, we added a comment on their similar vertical resolution in line 190: “Nevertheless, both instruments have a similar vertical resolution of about 3 km (She et al., 1998) and 3.5 km (Remsberg, 2009) for the lidar and HALOE profiles, respectively.”

Remsberg, E. E.: Trends and solar cycle effects in temperature versus altitude from the Halogen Occultation Experiment for the mesosphere and upper stratosphere, Journal of Geophysical Research: Atmospheres, 114, https://doi.org/10.1029/2009JD011897, 2009

Another global estimate with a different dataset can be used for comparison and can be found in Hampson et al. (2006).

We thank the reviewer for pointing out the TOVS data set used in Hampson et al. (2006). TOVS temperatures are available up to 10 mbar altitude, i.e. up to the middle stratosphere (Scott et al., 1999). Although another data set based on TOVS exists that even provides temperature layers between 1 to 0.4 mbar (https://daac.ornl.gov/FIFE/Datasets/Atmosphere/TOVS_atmos_prof.html), this as well only covers the upper stratosphere and lower mesosphere. Since our study focuses on the impact of the Pinatubo eruption on the mesosphere and mesopause region, this would be out of the scope of our study.

Scott, N. A., Chédin, A., Armante, R., Francis, J., Stubenrauch, C., Chaboureau, J., Chevallier, F., Claud, C., & Cheruy, F. (1999). Characteristics of the TOVS Pathfinder Path-B Dataset, Bulletin of the American Meteorological Society, *80*(12), 2679-2702

Kerzenmacher et al., Methodological uncertainties in multi-regression analyses of middle-atmospheric data series, 2006, *J. Environ. Monit.*, 8, 682-690, DOI:10.1039/b603750j.

Hampson et al., The dynamical influence of the Pinatubo eruption in the subtropical stratosphere, *J. Atmos. Solar Terr. Phys.*, 68, 1600-1608, 2006, dx.doi.org/10.1016/j.jastp.2006.05.009.

Remsberg et al., An assessment of the quality of HALOE temperature profiles in the mesosphere with Rayleigh backscatter lidar and inflatable falling sphere measurements, *J. Geophys. Res*., 107(D19), 10.129/2001jD001521, 2002.

We thank the reviewer again for taking the time to revise our manuscript and for providing insightful comments.