

Interactive comment on “Lidar temperature series in the middle atmosphere as a reference data set. Part B: Assessment of temperature observations from MLS/Aura and SABER/TIMED satellites” by Robin Wing et al.

Anonymous Referee #2

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This manuscript provides a 7-year middle atmospheric (30-80 km altitude) temperature comparison between ground-based lidar Rayleigh-Raman lidar measurements at Observatoire de Haute Provence (mid-latitude), and 12-hour-coincident MLS and SABER satellite measurement near this site. The comparisons show temperature differences of 5-15 K, either positive or negative, depending on the altitude and satellite data set considered. The conclusions are not new, but the authors have the merit to highlight (again) the issue of altitude registration, which might explain most of the differences observed near the stratopause. The main weaknesses of the current manuscript are

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1) the short (and old) time span of the comparisons knowing that all 3 instruments in question are still operational today, and 2) there is little, or no, investigation of the differences that are not explained only by altitude shift. To this respect, I encourage the authors to invite the MLS and SABER temperature validation teams to provide their inputs (and possibly add them as co-authors) I therefore suggest publication after major revisions, which: 1) Include a longer time period (e.g., 2004-2017) 2) Include inputs from MLS and SABER satellite teams 3) Include further investigation of the observed differences that may arise from lack of temporal and horizontal co-location

Some minor comments:

Line 59-60: Schwartz et al, 2008 should be included here. Also, check more recent publications (for e.g., referring to GOZCARDS)

Figures 3 and 5: I suggest showing the temperature fields as well, at least for lidar, and preferably for both lidar and satellite. This way, differences on the 2D contour plots can perhaps be associated with specific temperature features

Lines 255-260: There is little quantitative discussion of the temperature uncertainties throughout this manuscript. Although I understand there is a "Part 1" manuscript, a figure showing typical systematic, random and total uncertainties for lidar, MLS and SABER, as a function of altitude, would be very useful.

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