

The authors investigate the potential for energetic particle precipitation events to directly influence the neutral atmospheric temperature profile in the mesopause region, which is probed via OH rotational temperature measurements from a spectrograph on Svalbard. Eight individual EPP events are discussed after sifting through 10,000 hours of radar data with strict, but appropriate selection criteria. A mechanism involving the depletion of the OH layer is suggested to account for the observed temperature change, and a conclusion that the recovery in temperature happens quickly enough to have little effect on the large scale mesospheric temperature is reached.

1. General comments:

- The reviewer agrees with the motivation behind the study, and is happy with the quality of data and method of analysis. Response to the initial reviews is appropriate and thorough and the adjustments made are sufficient to support the conclusions presented within.
- Some clarification/rewording needed in L4-5 (abstract) – it's explained later than you use all manda/ipy experiments between the start of the IPY and Feb. 2019, but this sentence reads as if the experiment was run continuously between the IPY and Feb. 2019.
- In Table 1. perhaps display the quantitative magnitude of the change in temperature as well as the classification of increasing/decreasing/stable
- During discussion of 3rd event (L178 – 183) the author states: 'The minimum temperature is measured at the time of the electron density maximum' however in the corresponding plot of Figure 2 there is no temperature measurement coincident in time with the electron density peak (at ~22:50UT).
- Some clarification needed during discussion of the superposed epoch analysis (L213-222). Are the OH temperatures/intensities averaged to produce the temperature/intensity values at the EPP onset time (e.g. Epoch 0) the measurements closest to the onset in time (as discussed earlier)? I understand this is implied when generating a superposed epoch analysis, but a statement that the measurements are never exactly aligned with epoch 0 or the EPP onset time would aid clarity.
- Author states on L219-220 that 'The upper percentile does not show a clear signature of a temperature decrease' whereas the plot shows the upper red curve showing a similar decrease in temperature (at epoch 0) to the median and lower percentile curves. Some clarification needed. L217-218 also states that: 'The zero epoch time (EPP onset) shows the lowest temperature both in the median (blue) and the lower percentile (lower red) curves.' The temperature at zero epoch for the median curve, is not the lowest temperature seen within that curve, so some rewording needed, likely just to clarify that it is a local decrease seen at epoch 0, rather than a global minimum.
- Author's discussion regarding the potential OH temperature changes driven by large scale atmospheric dynamics (Paragraph containing L248-260) is valid and necessary in the discussion. However, the added lines from L255 onward discuss a scatter plot which is not presented in the article (scatter of OH-I vs OH-T), perhaps include this scatter plot in Figure 3? There is room in the top panel alongside the OH-I vs E-dens. Scatter plot.

2. Minor comments:

Small grammar improvements and some suggestions to re-structure particular sentences (the latter are left to the author's discretion)

- L2 (abstract): Sentence beginning “Recent results, however...” >>> “However, recent results are inconsistent, which leaves the mechanism and effects still unresolved”
- L15 (abstract): “as opposed proxies” >>> “as opposed to proxies”
- L58/59: “the temperature gradient in the mesosphere” >>> “the local temperature in the mesosphere” – clarification, as it's only dependent on the temperature gradient within the OH layer, not the entire mesosphere.
- L60/61: “during the solar cycle 23 and 24” >>> “during solar cycles 23 and 24”
- L77: “the spectrometer” >>> “spectrometer” – no need for ‘the’ since the spectrometer hasn't been formally introduced yet, just spectrometer measurements is fine
- Figure 1: Caption, last sentence: “The vertical red lines in the mark the time...”>>> “The vertical red lines mark the time...” – no need for ‘in the’
- L245: “Our *sixth event* and *eight event* was classified...” >> “Our *sixth event* and *eight event* were classified...” – replace ‘was’ with ‘were’ since it is now plural (two events)
- L284: Replace ‘height’ with ‘altitudes’