

Review AMT :
Passive ground-based remote sensing of radiation fog

First of all, I would like to thank the authors for their efforts to take into account the suggestions and corrections especially for including the discussion with the integration of the in-situ surface sensor within the MWR retrievals and including the ceilometer measurements to better detect fog in the lack of visibility measurements. I am just wondering if what is defined in the manuscript as the fog detection with the ceilometer could be associated with aerosol hygroscopic growth as shown in Haeffelin et al 2016. In that sense I think it would be good to remind the reader of the new fog definition used in the manuscript : not visibility < 1000m as usual but : « the presence of near surface liquid water that has a detectable radiative impact ». I thus suggest some minor corrections following this direction through the paper. The line numbering is referring to the author's tracked changes document.

Line 90 : Can you mention that the relative LWP uncertainties from MWR for low LWP alone can be reduced by a combination from a 1 channel infrared spectrometer (Marke et al, 2016).

Table 3 is cut on the right.

Line 287 : initial increase in LWP associated with fog formation and visibility reduction. As you cannot be 100 % sure that this is associated with fog I would change into :
« initial increase in LWP **defined as an indicator of fog formation in this study that might lead to** visibility reduction by defining 'fog onset' as where the retrieved »

Line 409 : as the new fog definition used in the manuscript has been defined quite far from this section, I would remind the reader of this definition here :
the development of radiation fog under clear skies is detected earlier in the AERIoe retrievals compared to the MWRoe (**following our fog definition as the presence of near surface liquid water that has a detectable radiative impact**).

Line 418 (figure 10) : Could the authors clarify if they are sure that the new « fog » definition from the ceilometer backscatter coefficient (increase in the ceilometer mean backscatter by more than three standard-deviations) represent well the fog formation and not the aerosol hygroscopic growth. In fact, Haeffelin et al 2016 demonstrated that an increase in the ceilometer backscatter coefficients can be associated with the aerosol hygroscopic growth and not the fog formation. This is used in pre-fog alerts to identify the aerosol hygroscopic growth occurring in fact before fog formation. I have some doubts because, in figure 10, the ceilometer output is « obscured signal » and not « vertical visibility » up to ~1h30 UTC. This would make a difference with the MWR detection of ~40 minutes instead of ~ the announced 2 hours by using the fog onset definition based on the LWP increase or the ceilometer backscatter coefficient increase.

Could you please explicit why you think that the ceilometer backscatter coefficient increase can be considered as fog formation between 0 and 1h30 and not due to aerosol hygroscopic growth ? If you think that obscured signal means that droplets are present, in that sense it would be in line with your new fog definition but I think it would be valuable for the paper to just add a few lines of discussion on this subject (aerosol growth versus presence of fog droplets and remind again that if this is for sure liquid droplets this is in line with the fog definition used in the paper).

Line 536 : « This means that the AERIoe is consistently able to detect small changes in LWP that signify the onset of radiation fog and reduction in horizontal visibility ». According to your fog definition, I would change into :

This means that the AERIoe is consistently able to detect small changes in LWP that **might initiate** radiation fog and reduction in horizontal visibility