

Review of “Super-cooled liquid fogs over the central Greenland ice sheet” by Cox et al.

The paper provides a detailed analysis of fog hydrometeors and their effects at the Summit site from 2012 to 2014. Interesting results include the identification of liquid versus ice fogs, their microphysical properties including their time evolution and seasonality, how ice particles and super-cooled droplets can co-exist in a vertical column in the boundary layer, and their effects on radiative forcing. The paper is well-written and organized, the measurements are of scientific significance and the novel results improve our understanding of the role of cold fogs in an Arctic setting. I would accept the paper as it stands but ask the authors to address the following minor questions.

1. A fairly convincing case is made for the settling of hydrometers to explain the difference of microphysical properties between 10 and 2 m in some cases. Based on the mean particle size can you calculate the terminal velocity and see if it is consistent with the time lag identified at 2 m with respect to 10 m?
2. Although the Summit site is likely quite flat, can the authors rule out the possibility of any uplift effects when the wind direction and speed might favor adiabatic cooling based on the local but subtle topography.
3. Is it possible that thermal tides, as measured by the surface barometer, might have a role in the observed diurnal signals when solar radiation is not the obvious forcing mechanism?