This manuscript of aircraft field measurements in the Arctic summer ought to be published after numerous corrections and changes that I have listed.

CDNC is an awkward representation of cloud droplet concentrations. It is used by fewer authors because, for instance, N_c is shorter. Some use N_d but that should be reserved for drizzle drops. Or in this manuscript where only concentration at 0.6% is used $N_{0.6\%}$. CCN concentrations should be N_{CCN}. CDNC differs from CCNC by only one of 4 capital letters and D and C between C and N are not so easily distinguished, this is too confusing. I had to constantly reread to be sure of which one was referred. Supersaturation should be abbreviated S to save a lot of space.

The CCN-limited regime of Mauritsen needs further description. This is not the sort of well accepted concept that seems to be implied in this manuscript. It has apparently not been cited in other papers. If it has, then please cite. It is only in this original paper where it is not referred to as Mauritsen except in the author list. Most importantly, it is incorrect to say that there is no aerosol limitation. Within this regime there may not be a linear relationship (or any relationship) between N_c and N_{CCN} but the mere fact that N_c is so low is because N_{CCN} is that low. This cannot be dismissed as no aerosol effect below the Mauritsen limit. There seem to be two separate aspects. One is the apparent loss of linearity (or any relationship) between aerosol and droplets at low concentrations. The other seems to deal with long and perhaps short wave radiative differences between the regimes.

Yum and Hudson (2001), which is cited, showed strong N_{CCN} vertical gradients with much lower N_{CCN} at lower altitudes. This seems consistent with the lower N_c of LA than HA clouds. They attributed the low low altitude N_{CCN} to cloud scavenging because when there were no clouds low altitude N_{CCN} was higher and the vertical gradient disappeared. This "scavenging" must have been due to coalescence among droplets that reduce N_c and thus N_{CCN}. Brownian scavenging would also be at work but would reduce only the small interstitial particles that should not serve as very good CCN. Hudson et al. (2015; JGRA) demonstrates the effects of coalescence scavenging. Coalescence cannot and should not be so easily dismissed as it seems to be in this manuscript. Coalescence is probably even more active in warmer summer than spring. Thus, the low low-altitude N_c and N_{CCN} are not necessarily (probably not) due to low N_{CCN} natural sources. Low N_{CCN} is what is left after cloud scavenging. See also Wylie and Hudson (2002; JGR). Scavenging would be a reason that N_c and N_{CCN} would not be related. Furthermore, coalescence results in larger (lower S_c) CCN. Furthermore, droplet and aerosol measurements at such low values are more uncertain and thus it is difficult to dismiss relationships.

There seems to be a recurring error. If this is not an error much more explanation needs to be given to such counterintuitive results. Higher concentrations in HA clouds should be associated with lower cloud supersaturations (S) and activation of only larger particles. Lower concentrations of LA clouds should result in higher S and activation of smaller particles. The latter is stated a couple of times. But in several (at least 3) places it is stated that HA clouds make higher S than LA clouds. This seems contradictory to other statements in the manuscript. If this is somehow true then it is big news and requires much further explanation.

Hegg et al. (1995; JAM and 1996; JGR) and Radke et al. (1976; JAM) also made Arctic CCN measurements, the latter in June.

In the process of commenting on several manuscripts by Asian authors, whose native languages do not include articles, I have been forced to conclude that articles are often overused, especially the definite article. This is more of a tendency on this side of the Atlantic. Brits tend

to shun the more than Americans; i.e., “call police” or “go to hospital” rather than “call the police” or “go to the hospital”. Since in earlier decades I noticed that Canadians had British English tendencies I am surprised at the overuse of the definite article in this manuscript. Perhaps this is Americanization. Since continental Europeans would tend more toward British English and since this is a European journal it seems appropriate to cull the thes. Moreover, when nearly every noun is preceded by the, the loses whatever impact the has.

L27. Delete 2nd the.
L28. Delete 2nd the.
L34. Space before 50.
L35. Higher concentrations for HA clouds should produce lower S. Smaller particles are more likely associated with LA clouds.
L37-40. Line 37, “(CCN)-limited regime of Mauritsen” and 38, “In that CCN-limited regime” are contradicted by line 40, “suggesting no aerosol limitation.” Just what does CCN-limited mean? Why is this Mauritsen regime called CCN-limited? Within this regime the CCN do not appear to cause any limitation because N_c is not related to N_{CCN}.
L48. Delete the.
L49. Delete 2nd the.
L52. Delete 2nd the. Change last the to a.
L53. Delete last the.
L59. Delete last the.
L59-61. Is this a trend over time or a constant factor?
L68. Delete the.
L77. Hudson et al. (2010) could be cited here as well.
L81. Insert that before may.
L82-5. This sentence is too long and thus too confusing.
L83. Delete –based.
L90-1. Not clear. How is this required?
L98. Insert to be after considered.
L100. Delete 2nd , 3rd and 4th the. Delete 2nd of. Move effects after aerosol.
L112. Delete the. Concentration plural.
L114. Delete the twice. Delete within. Delete , and. Move cloud in front of microphysics. Period after microphysics.
L115. Insert Moreover, . concentration plural. Was to were.
L131. Delete are. Delete ing. Period after droplets. Change which will to This would.
L156. Delete nm. Change 1 μm to 1000 nm.
L161. Is this the internal pressure of the instrument? If so then so note.
L191-3. Say that vertical wind could not be measured rather than this round-about statement.
L202. Delete at. Insert of after off.
L219. Could this be intense.
L229-30. For the entire project or period 2?
L250. Change The latter to Descent.
L252. Delete based on.
L254. Delete 2nd and 3rd the.
L274-6. Seems to be adiabatic?
L276. What is the alternate cloud formation?

L279. Is this not nucleation, which should not be called scavenging?
L281-2. Citation.
L286-8. Closure of what concentrations. More explanation.
L288. Either values or compares need to lose s.
L289. Why?
291-2. Depends on composition.
L294. This comparison seems out of context. Is there a reference for this? If this is so important it should not be just supplementary. These Atlantic measurements should have the same scrutiny as the Arctic measurements.
L302. There seems to be more variability at all altitudes. Delete the twice. Move overall right after and.
L327. Delete 2nd the. Add s to equal.
L329. Insert apparently after were.
L332. Delete the twice.
L346-7. Explain this transfer.
L351. In to within.
L363. Reached low or high?
L368. Delete 2nd the. Delete be.
L372. Why/how is this characteristic of vertical mixing?
L396. Apparently this is the cloud threshold used in this study. This needs to be stated clearly. This is a rather low threshold, many use 0.03 or 0.1.
L397. Delete first seconds.
L398. How about a standard deviation.
L402. In-situ volume apparently means ambient volume. STP is apparently in parentheses? So state.
L411. For above 200 m is awkward.
L413. Figs.
L414. To above 25 is awkward.
L415-6. Can't this be more precise?
L427-8. Needs citation.
L428-9. Why would vertical motions not be responsible for clouds?
L432. Delete the.
L440. R^2 does not match Fig. 7a.
L444. What is they?
L445. Delete the thrice. Delete by evaporation of droplets. That phrase seems to sort of contradict without reducing N_c.
L447. Rate of cooling with altitude? Greater vertical wind (W)? But this will not affect LWC, which depends on distance from cloud base not W.
L448-51. Perhaps increased N_c will reduce coalescence but not increased LWC.
L451. This is not really an increase but rather higher LWC than otherwise.
L453-4. Eliminate commas. Change which to that. This is a restrictive clause rather than a nonrestrictive clause.
L460-1. Explain.
L461. Relationship plural. Insert is after it.
L461-3. Why?
L462. Um to μm.

L463. Fig. 8 does not have panels.
L482-3. Of course they do not.
L483. Delete necessarily. 2nd to to of.
L488. Less surface area.
L501-5. This appears to be stated incorrectly, backwards. If not much further explanation is required for these extremely unusual results.
L525-6. How and why?
L536. Insert below 16 after points.
L537. Last the to these.
L542. Delete the twice.
L543. Comma after clouds.
L544. Insert that before the.
L546. Delete 1st the. Change 2nd the to that.
L544-7. Which differences are referred to here? If it is among the July 5 measurements then ok. But otherwise not.
L555-6. Has this been demonstrated previously? If so cite. I do not seew how you can discount coalescence. Or why this is needed.
L558. Must be referring to vertical wind? So state.
L565. Aerosol impact is ubiquitous. N_c below Mauritsen is caused by low N_{CCN}. You cannot get around this.
L590-1. Again this is the cloud threshold and should be so stated.
L605. And to with.
L606. LA clouds with lower N_c should have higher not lower S.
L609. Insert relatively clean after for.
L621-2. All samples exhibit a clear influence of the aerosol. There are differences between the two regimes.
L623. Not sure you can call them polluted.
L625. There is no proof of natural sources.
Table 1. Explain parentheses. Apparently no distinction of LA and HA?
Table 2. got to at?
Most figures need tic marks.
When there are various panels there should not be repetition of every axis label and title. This correction could help allow larger panels. Many panels are small and difficult to read.
Fig. 3. Is a prime example. It is not necessary to write the horizontal axis titles for a-d as they are the same as the panels below. The horizontal axis ranges could also be adjusted so that it is not necessary to write the labels for a-d as they can be the same as those below. B, d,f and h do not need vertical axis titles and labels as they are the same as a, c, e and g respectively.
Fig. 6 should be landscape with panels side-by-side and then only one vertical axis title and label would be necessary for a. Panels should then be moved closer to each other. Moreover, the figures could be larger.
Fig. 7 Vertical axis titles and labels for b should be removed and panels moved closer together. Orange appears yellow.
Fig. 8. Is it July 17 or 11? With so few data points probability or significance levels should be shown. This could also be done for Fig. 7.

Fig. 9. Rescale horizontal for a (0-700) and remove labels. Or make landscape with panels side-by-side with the same vertical scales thus removing b labels. There are no blue data points and yellow seems to be mislabeled.
Fig. 10. Reverse the axes of b so that CCN is the horizontal for both and then the horizontal title and label can be removed from panel a. Or reverse axes of a and plot side-by-side using landscape.
Fig. 11 caption. In-situ probably means ambient. July 7 appears yellow not orange. July 5 is blue not red.