

## ***Interactive comment on “Large increases in $N_{cn}$ and $N_{ccn}$ together with a nucleation-mode particle pool over the northwestern Pacific Ocean in the spring of 2014” by Juntao Wang et al.***

### **Anonymous Referee #3**

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This paper presents potentially interesting information on particle number size distributions and concentrations as well as CCN concentrations in a marine boundary layer. However, before recommending the acceptance of this paper for publications, several issues need to be discussed in more detail and care. My main points in this regard are given below.

Section 1. The authors need to define the scientific aims of this study more clearly in the paper. It is not enough to say what is being studied in the paper. The sentence “Several new findings have. . .” on page 3 sounds strange here.

Section 2.1. Description of the methods is incomplete. Nothing is said about the de-

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tection limits of gas-phase instruments, or the performance of any of the instruments during the campaign. Was it tested whether the instruments (e.g. CCNC) performed during the measurements? The authors mention a correction factor of 1.25 for the FMPS but do not explain where this factor comes from. What are the potential effects of uncertainties in FMPS measurements on the results discussed in this paper? (something is mentioned on page 6, lines 23-26, but probably more is needed).

Section 3.1, last paragraph. There is a larger number of papers reporting CCN concentrations in the scientific literature. What was the basis for selecting these few studies when comparing results from this study? And why a single study conducted in Arctic was chosen here?

Section 3.3. After the more than 20-year-old papers cited here, a large number of studies (even reviews) on marine number size distributions have been published. The authors should make better use of these, more recent studies.

Section 3.4. Again, there are a number of more recent airborne studies on new particle formation in and above MFL in the scientific literature.

Section 3.5. What is the purpose of the two sentences on lines 27-29 in this section? Also the discussion at the end of this section is a bit confusing.

Technical issues:

Why do the authors use such complicated format when presenting concentrations ( $M+N \times 10^{-3}$ ). Would it be much simpler just to give the numbers as they are?

Page 6, line 11: Following those in the literature, . . . ????

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Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2018-1089>, 2019.

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