

***Interactive comment on “Variations in Ncn and Nccn over China marginal seas related to marine traffic emissions, new particle formation and aerosol aging” by Yang Gao et al.***

**Summary:**

This work demonstrates the number concentrations of CN and CCN during a cruise campaign. The manuscript fits well to the scope of ACP. However, I am worried about the method used for retrieving hygrscopicity  $\kappa$ . This paper is worth to be published, but not in its current form. Thus I recommend it to be resubmitted after the following major comments listed below have been adequately addressed.

**Comments:**

1. Page 5, line 128: If the authors used CPC 3775, then the default  $D_{50}$  should be 4 nm. Did you alter the supersaturation to get smaller cut-off size?
2. Page 5, lines 134-139: Please provide the thermodynamic parameterizations for CCNC calibration. What do you mean “collection of CCN”?
3. Page 6, lines 161-171: I don’t understand the method to calculate the kappa value, of which critical dry diameter and  $Sc$  are needed. I guess there is no measurement of size distribution of CCN (DMA-CCNC), so how could you get the dry diameter?
4. Page 12, line 358-373: there are many assumptions in this section. Could AIM-IC measurement provide some evidence?
5. How you use Hysplit model and fire spots, I did not see it in the main text.
6. There are several grammar mistakes in the text and figures, the language, symbols and labels should be checked carefully.