

## ***Interactive comment on “Cloud condensation nuclei activity at Jeju Island, Korea in spring 2005” by M. Kuwata et al.***

### **Anonymous Referee #1**

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The authors present the temporal CCN number concentration and the size-resolved CCN/CN ratios at different supersaturation ratios at Jeju Island, Korea. The measured threshold diameters for CCN activation are compared with the calculated ones using Kohler theory with aerosol composition. The authors have given a detailed and careful discussion. The manuscript is well written and is good for publication in Atmospheric Chemistry and Physics. I have few comments.

### Comments

#### 3.1 CCN measurements

Page 15809. Figure 1 shows the CCN observation system used for this study. In this system, ambient particles were dried to a relative humidity (RH) <5

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How the authors know the ambient particles are all dried after passing the diffusion dryers? Would it be possible some ambient particles still retain water? How would it affect the data analysis? Would the existence of wet particles help to explain the discrepancy between the modeled and observed D50?

#### 4.1 CCN/CN size distributions

Page 15812. Is there any explanation why the curve for CCN data on 3/28 (22:00-22:30) is not sigmoidal in Figure 3? Does this phenomenon commonly observe? How would it affect the determination of D50?

##### 4.2.1 CCN number concentration

Page 15813. Sawa et al. (2007) have reported high CO concentration between 22 to 24 March and 30 March to 2 April due to transport of CO from the Korean Peninsula and China. During these periods, CCN concentration also increased (Figs. 4a and d). Thus, these high CCN concentrations were likely caused by the enhanced concentrations of anthropogenic aerosols transported from these regions.

Can the authors explain why the high CCN concentrations are related to enhanced concentrations of anthropogenic aerosols?

#### 5.3 Possible causes of the discrepancy

The authors have discussed the possible causes of the difference between measured and predicted D50. It would be good to include the overall uncertainties or error bar in Figure (e.g., Figure 10).

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