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Comment

## ***Interactive comment on “Modelling atmospheric structure, cloud and their response to CCN in the Central Arctic: ASCOS case studies” by C. E. Birch et al.***

### **Anonymous Referee #2**

Received and published: 20 March 2012

This is an interesting paper that addresses important observations of clouds in the Arctic. Polar clouds are badly represented with NWP and Climate models and this is a good attempt to redress these failures. While I have no hesitation in recommending the paper for publication there are a few minor points that could be clarified.

The authors assume that the vertical distribution of LWC within the cloud is adiabatic (20 2565) and I wonder if that is true of the tenuous clouds observed in the 5th regime? I would like a bit explanation of the physics of the tenuous cloud.

I also wonder about the effect of open water leads on the albedo. The observed albedo seems to be much higher than the model albedo at most times even when a crude

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estimate is made of the lead fraction. This could have quite a big impact on the model  
- could a better estimate of the area averaged albedo be made from satellite measurements?

Figure 2 has the temperature in K not degrees C - is think this may be a mistake.

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 2559, 2012.

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