

## ***Interactive comment on “Mapping the uncertainty in global CCN using emulation” by L. A. Lee et al.***

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Apologies for missing the following response in the original reply.

### **This still doesn't mean the emulator can be used to assess whether the model framework, the collection of all encompassing processes, is sufficient to reflect true atmospheric uncertainty?**

Emulation means that we can estimate what the model would predict throughout the  $n$ -dimensional parameter uncertainty space (here  $n=8$ ) given some model runs throughout this space. In normal calibration studies the model is compared to observations from a single baseline run and it is unknown whether the model will calibrate better with observations in some other part of the parameter uncertainty space. We can identify when GLOMAP may have some optimal parameter setting for calibration and when no optimal parameter setting exists given all the parameter uncertainties. Emulation only

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takes into account the parameter uncertainties though, and whilst it might help to show the existence of structural deficiency, multi models are needed to assess the structural uncertainties so emulation alone cannot reflect the true atmospheric uncertainty.

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