

## ***Interactive comment on “Growth of atmospheric clusters involving cluster-cluster collisions: comparison of different growth rate methods” by J. Kontkanen et al.***

**Anonymous Referee #1**

Received and published: 20 February 2016

The paper explores the differences in estimated growth rates for sub-3nm particles by three different methods. The work seems solid and thorough, and it is of publishable quality. However, I'm unsure if the interest is broad enough for ACP as opposed to e.g. Aerosol Science & Technology. I'd recommend either GMD or AMT, though the paper is a modelling study that is of interest to observationalists, so it sits between those journals. I'll leave it up to the editor to make a judgement call.

If the paper is to be published in ACP, I have several minor comments that should be addressed.

P2 L11: “CGR” doesn't correspond to the previous text. Can you define it? Is it “condensational growth rate”?

C1

P3 L6-7: “AGR” and “FGR”, same as above.

P4 L7-8 and throughout: I'm somewhat confused by the different sinks in this paper. Is the loss due to coagulation with larger particles included here? Is the loss due to coagulation between the model-resolved clusters included elsewhere when discussing the “loss coefficient”?

Eqn 1: What about the source by a collision of two clusters that are not in the previous bin, but where the sum of their molecules would put the resultant particle in the current bin?

Sect 2.2: Would it have made sense to do a simulation set where you simulation every cluster size from 1-70, so you don't have any numerical issues? this would be a useful comparison.

P7 L4: Why is the concentration in units  $\text{cm}^{-3} \text{s}^{-1}$ ?

P7 L30: What values of monomer sources were used earlier (I think only steady state concentrations were given)?

---

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2015-1033, 2016.

C2