Atmospheric
Chemistry
and Physics

Supplement of

Survival probabilities of atmospheric particles: comparison based on theory, cluster population simulations, and observations in Beijing

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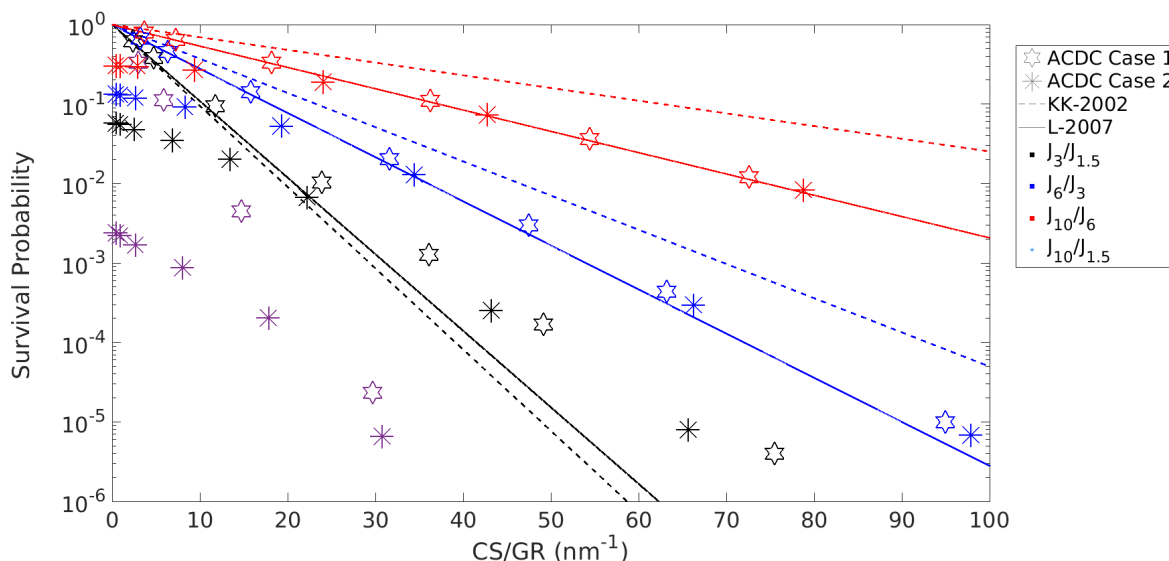*Correspondence to:* Markku Kulmala (markku.kulmala@helsinki.fi)

Figure S1: Survival probabilities from 1.5 to 3 nm ($J_3/J_{1.5}$), from 3 to 6 nm (J_6/J_3), from 6 to 10 nm (J_{10}/J_6), and from 1.5 to 10 nm ($J_{10}/J_{1.5}$). Horizontal axis is expressed in terms of background condensation sink of sulfuric acid (CS) and the mean growth rate (GR) in the size range. Survival probabilities based on Atmospheric Cluster Dynamics Code (ACDC) simulation results and theoretical predictions are included. The ACDC survival probabilities are divided to two different cases: in Case 1 no collisions between clusters occur and in Case 2 collisions between clusters are also allowed to occur. In both Case 1 and 2, monomer concentration is $C_{mon} = 1 \cdot 10^7$ cm^{-3}. GR is based on linear regression. The theoretical predictions are based on Kerminen and Kulmala (2002) (KK-2002) and Lehtinen et al. (2007) (L-2007) formulations, which assume constant GR.
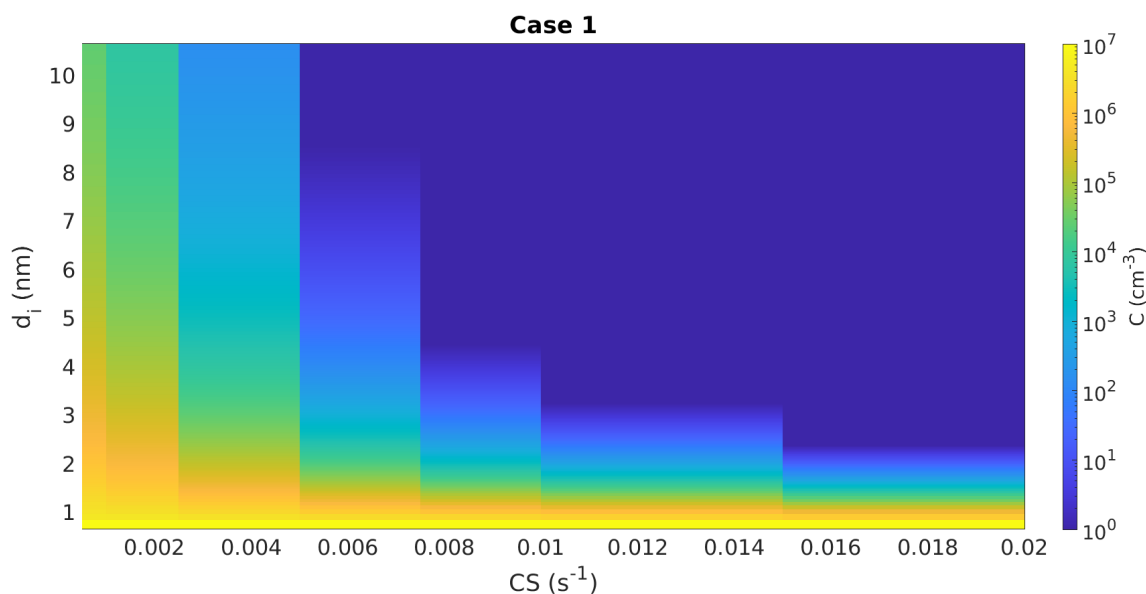

Figure S2: Steady-state cluster size distributions for different background condensation sinks (CS) in ACDC Case 1 (no cluster-cluster collisions) simulations. Cluster concentration is C and diameter is d_i.
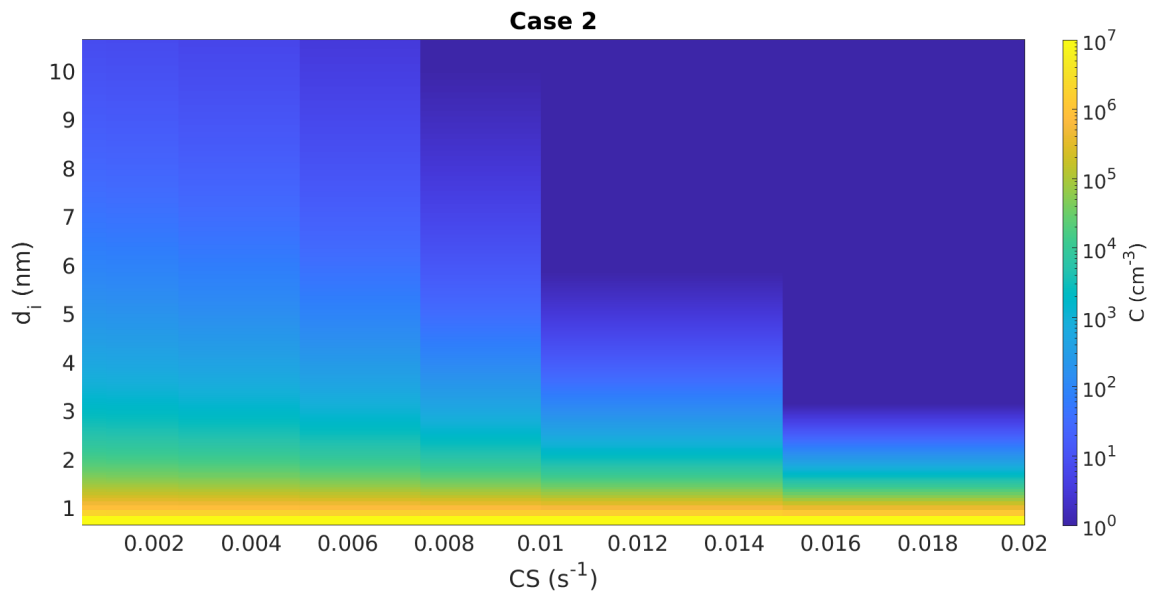
Figure 3: Steady-state cluster size distributions for different background condensation sinks (CS) in ACDC Case 2 (with cluster-cluster collisions) simulations. Cluster concentration is *C* and diameter is d_i.