



Supplement of

Stochastic homogeneous freezing of supercooled droplets in mixed-phase clouds in particle-based idealised microphysics framework (exemplified with PySDM v3.0)

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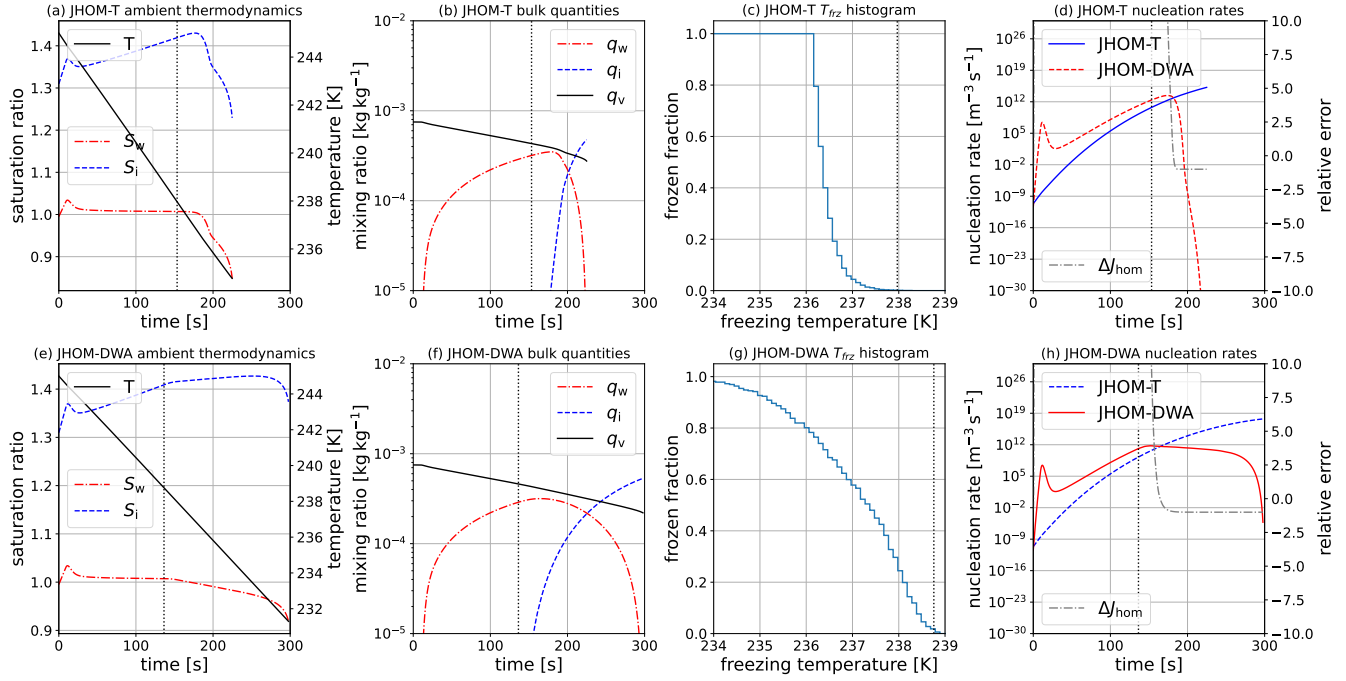


Figure S1. Air parcel ascent simulations for $w = 5$

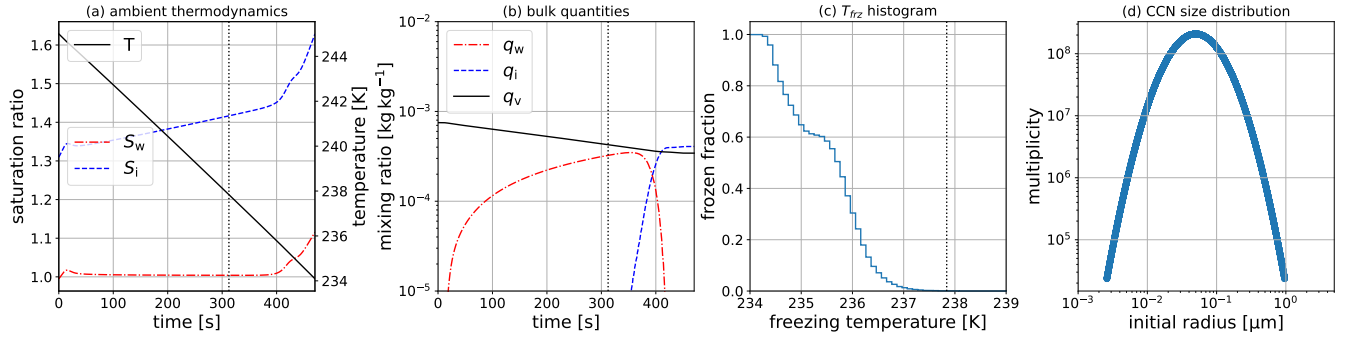


Figure S2. Air parcel ascent simulations for a lognormal CCN spectrum showing (a) ambient temperature T and saturation ratios S_w and S_i , (b) bulk quantities, (c) freezing temperature histogram, and (d) initial CCN size distribution. The dashed line indicates the first freezing event.

Ensemble simulations for lognormal CCN size spectra

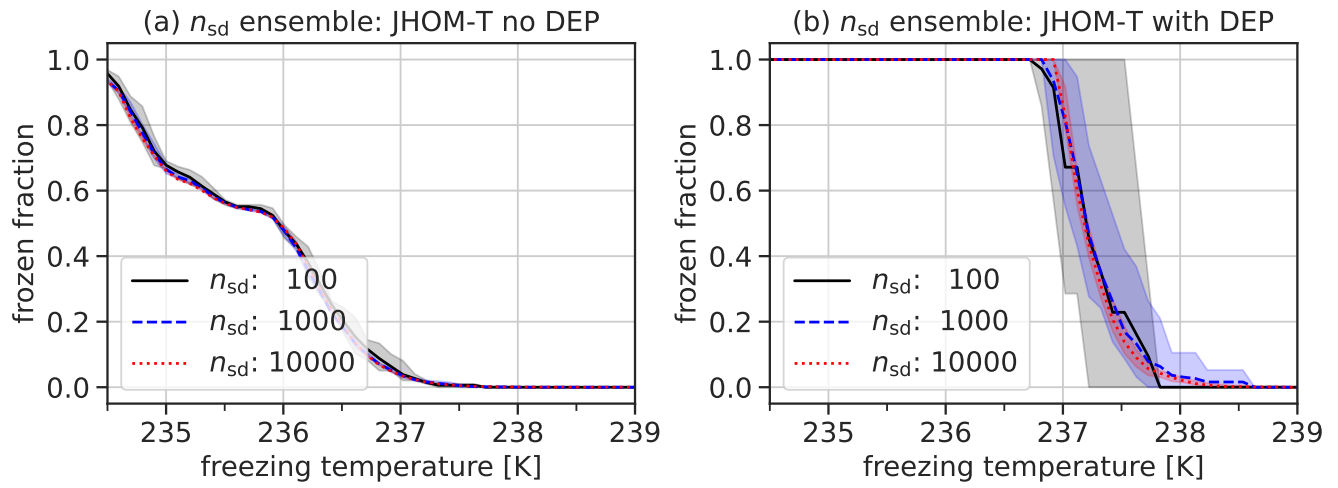


Figure S3. n_{sd} ensemble simulations using the JHOM-T nucleation rate without (a) and with (b) vapour deposition on ice. A lognormal CCN size distribution with $\sigma = 2$ is used instead of a monodisperse spectrum.

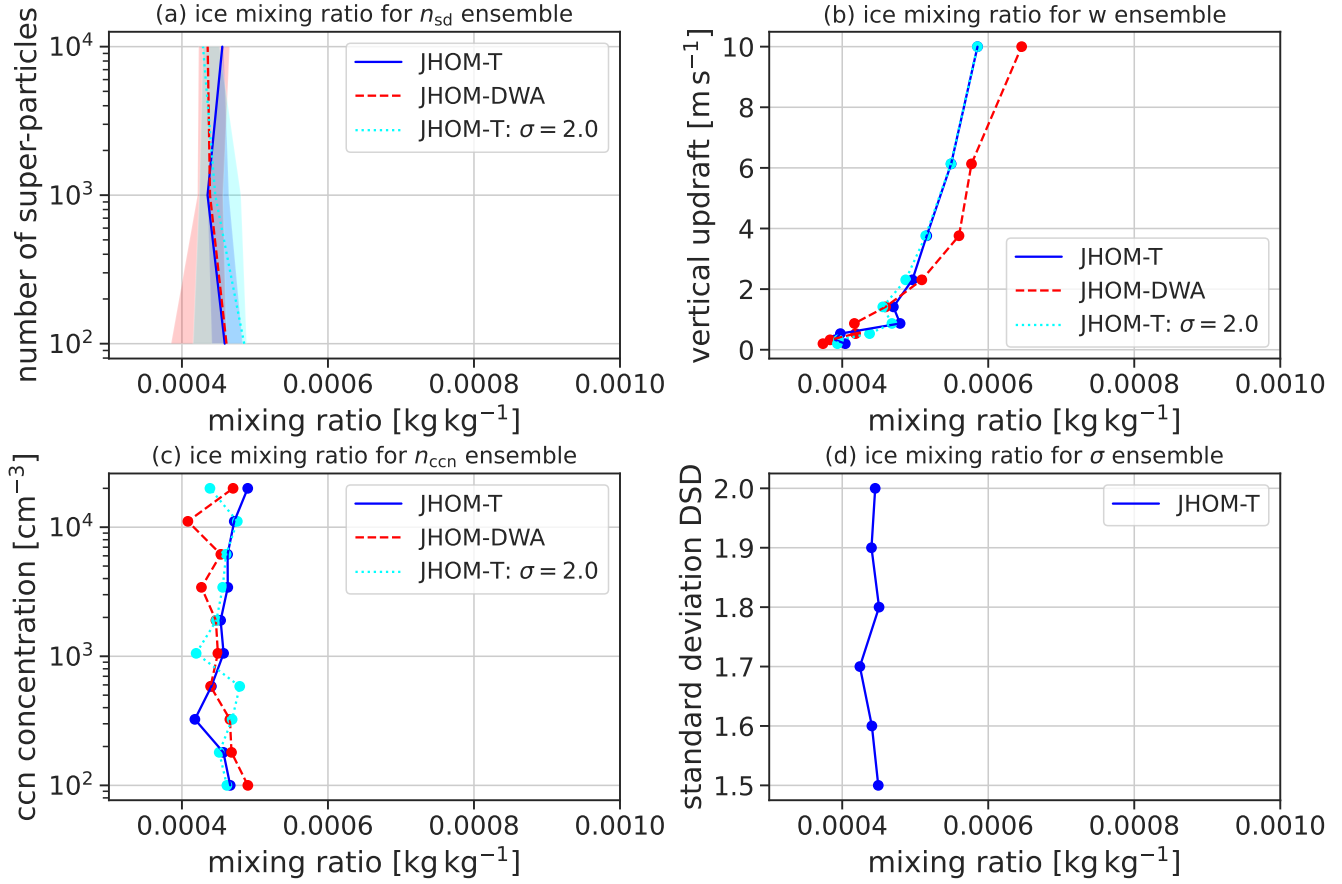


Figure S4. Bulk ice mixing ratio q_i for (a) the n_{sd} ensemble, (b) the w ensemble, (c) the n_{ccn} ensemble, and (d) the σ ensemble. Blue lines indicate simulations using the JHOM-T nucleation rate with monodisperse CCN spectra, teal lines the JHOM-T rate with lognormal CCN spectra, and red lines simulations using the JHOM-DWA rate.

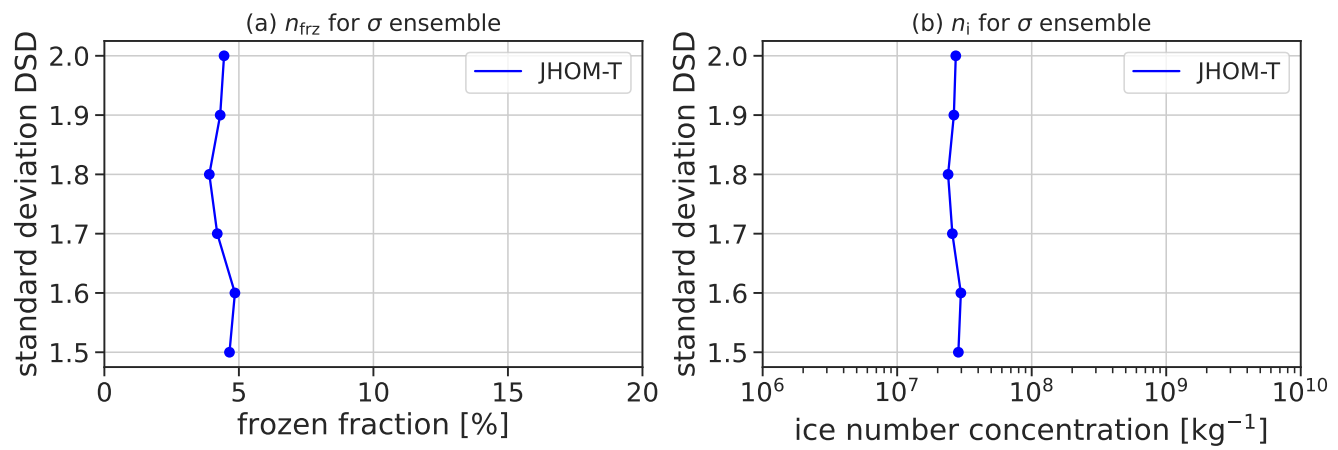


Figure S5. (a) frozen fraction n_{frz} and (b) ice number concentration n_i for the σ ensemble using the JHOM-T nucleation rate.