Review of "Modeling Collision-Coalescence in Particle Microphysics: Numerical Convergence of Mean and Variance of Precipitation in Cloud Simulations Using University of Warsaw Lagrangian Cloud Model (UWLCM) 2.1" by Zmijewski et al. (gmd-2023-44)

The response letter and the revised manuscript address most of my concerns satisfactorily. I especially enjoyed the addition of the multi-box simulations and the additional analyses on the effects of subgrid-scale velocity fluctuations on the convergence. While I have some minor comments below, I consider this manuscript almost ready for publication.

Minor Comments (line numbers refer to the tracked-changes document)

Ll. 1 – 17, 515 – 530: Explicitly state how much subgrid-scale fluctuations accelerate convergence.

Ll. 228 – 231 and Sec. 2.1: How well do the initialization method capture the large tail of the droplet size distribution? The large tail is most important for the initialization of precipitation, and hence the higher-order moments of the droplet size distribution. A figure showing higher moments of the initial droplet size distribution for different numbers of simulated particles would reveal if there is a dependency on the initial conditions. I suspect these higher moments are not converged, so the subsequent simulations struggle to converge. All moments of the initial droplet size distribution should agree for a fair comparison.

Ll. 295 – 296: The reference to Grabowski and Abade (2017) is misleading. First, their paper is about a subgrid-scale model for supersaturation fluctuations, and does not primarily focus on velocity fluctuations. Second, subgrid-scale models for velocity fluctuations in Lagrangian models exist for much longer (e.g., Weil et al. 2004). Third, how is the subgrid-scale model coupled? Does it obtain some information on subgrid-scale turbulence kinetic energy?

Technical Comments

I repeat my previous comment: "When narrative citations (\citet{…}) are used, a semicolon should not separate the individual references, but a comma or an 'and'." The authors claim that the GMD LaTeX template allows this, but it causes grammatically wrong sentences. For instance, instead of writing "In line with conclusions of Schwenkel et al. (2018); Unterstrasser et al. (2020), multi-box simulations show […]" the authors should write "In line with conclusions of Schwenkel et al. (2018) and Unterstrasser et al. (2020), multi-box simulations show […]". The semicolon separates the sentence in two meaningless parts. Only because one can create such citations with the template, they are not correct!

References

Grabowski, W.W. and Abade, G.C., 2017. Broadening of cloud droplet spectra through eddy hopping: Turbulent adiabatic parcel simulations. *Journal of the Atmospheric Sciences*, *74*(5), pp.1485-1493.

Weil, J.C., Sullivan, P.P. and Moeng, C.H., 2004. The use of large-eddy simulations in Lagrangian particle dispersion models. *Journal of the Atmospheric Sciences*, *61*(23), pp.2877-2887.