Comment on the revised manuscript ”The influence of particle composition upon the evolution of urban ultrafine diesel particles on the neighbourhood scale” by Irina Nikolova et al.

The revised manuscript by Nikolova et al. addresses a bundle of reviewer concerns in a favourable way and clarifies several limitations of the presented method to study the evaporative potential of diesel particles on timescales from 1 s to about 100 s after the initial cooling and expansion phase. I am still sceptical about the neglect of coagulation in the study. However, owing to the unknown nature of the non-volatile particles in the simulation, the influence of these particles and their morphology on the competition or feedback between coagulation and evaporation cannot be considered with the present approach.

The study uses unity mass accommodation coefficient (sometimes termed evaporation coefficient) for all volatile compounds. Grieshop et al. (2009) suggested that organic aerosol from engine lubricating oil has a two or three order of magnitude lower mass accommodation coefficient (between 0.001 and 0.01), which would greatly affect the evaporation rate for a compound at a given saturation concentration. The properties of directly sprayed lubricating oil droplets might be different from pure n-alkane particles, but the C18 to C26 n-alkanes used as surrogate components here have been identified in lubricating oil. It would strengthen the reliability of the results from the present study if the sensitivity of the threshold modal composition and nucleation mode peak diameter to variations of the mass accommodation coefficient was tested at least for the more commonly expected range between 0.1 and 1.

Grieshop, A. P., Miracolo, M. A., Donahue, N. M., and Robinson, A. L.: Constraining the Volatility Distribution and Gas-Particle Partitioning of Combustion Aerosols Using Isothermal Dilution and Thermodenuder Measurements, Environ. Sci. Technol., 43, 4750–4756, doi:10.1021/es8032378, 2009.

Technical corrections in the Supplement:

Line 57 "is the number of particles per bin width ΔDp, [# m-3]."

Missing n(Dp)

Line 77, Eq. (4)

f has to be function of x: $f(x|m,\sigma)$