Comments from reviewer 1 : The method to redistribute number concentrations in the low diameter range of emissions uses a fitting parameter, as stated in the Abstract. In sections 2.3 and 3, this parameter is called distribution coefficient alpha_em. In section 2.3 it should be better explained how the pre-defined number size distribution has been obtained at emission, and how the parameter is applied to modulate the pre-defined size distribution. The parameter value is finally deduced in a sensitivity analysis for a non-event period by comparing simulated number concentrations against measured data. If a fitting procedure was involved, the goodness of fit for the different variations of the parameter should be provided. Otherwise, I suggest to use the same name for the parameter in the abstract as in the manuscript text.

Our reply : No fitting procedure was involved, therefore the same name was added for the parameter in the abstract.

In section 2.3, the sentences : « However, the mass of particles PM0.1 is redistributed arbitrarily between the low range of diameters (between 0.01 µm and 0.0398 µm) and the high range (above 0.0398 µm) using a distribution coefficient α_{em} » are replaced by

« However, the mass of UFP particles PM0.1 is redistributed arbitrarily between the low range of UFP diameters (between 0.01 µm and 0.0398 µm) and the high range (above 0.0398 µm) using a distribution coefficient α_{em}, i.e. an emission ratio (α_{em}, (1- α_{em})) distributes PM0.1 in 2 size ranges. »

Furthermore the sentences « The choice of this arbitrary distribution coefficient, and a sensitivity study to it, is performed in section 3. » are replaced by

« The mass allocated to the section between 0.01 µm and 0.0398 µm corresponds to α_{em} times the mass of $PM_{0.1}$, and the mass allocated to the section between 0.0398 µm and 0.1 µm corresponds to (1- α_{em}) times the mass of $PM_{0.1}$. To determine this arbitrary distribution coefficient, simulations are compared to measurements during non-nucleation days using three different value of α_{em} : 10%, 15% and 25% (section 3) »