

## Replies to the comments of referee 2.

We are grateful to the referee for the constructive criticism, which helped to improve the clarity of the manuscript. Please find below the replies to the specific comments and an account of the modifications implemented.

*On page 3 just before equ. 3 it is stated that the "...FS coefficient ... connects the mass flux towards a molecule in the kinetic regime...". I believe it should be the "mass flux towards a particle".*

We agree with the comment and changed this as recommended.

*On page 6, lines 20/21, the authors mention that equ. (15) and (16) can be used in quasi-steady conditions together with distribution parameters changing slowly in time. To get some idea it would be helpful here if corresponding time scales would be mentioned. There is some indication given in a later section but should also be discussed here.*

We agree with the comment and add the sentence regarding time scales: «...change slowly in time (as discussed later, the typical time scale of the system relaxation to the equilibrium is expected to be not more than 20 min, hence, the time scale on the order of hours or diurnal scale can be used to define the slow change in this context).»

*Some clarification is needed in the discussion of Figure 6 on page 7, lines 26-31. Fig. 6 displays CS for several days but then it is referred to "note that  $Kn \sim 5.2$  on March 27th and  $Kn \sim 2.5$  on June 1st" (line 30). I don't see how this connects to Fig. 6, at least it is not visible to me.*

We agree with the comment. We changed this sentence to the following: «Note that the Knudsen numbers corresponding to the geometric mean diameters of the modes used for calculations are  $Kn > 2.5$ , and the largest particles taken into account here ( $d_p = 500$  nm) have  $Kn \sim 0.5$ , hence, the correction should perform well, as follows from Fig. 1.»

*Figure 3: Please expand figure caption, some more explanation is needed here. Also, no reference is made to the color code (condensation sink ratio).*

We agree with the comment. The caption is now expanded to read: «The ratio  $CS_{cor,0} = CS_{kin,0}$  as a function of  $\sigma_0$  (characterizing the width of the particle number-size distribution) and the Knudsen number  $Kn_0$  (corresponding to the mean geometric diameter of the mode).» We added the reference to the color code.

*Figure 8: Again, more elaborate figure caption would be desirable. What are the lines representing? BTW: the inset is hard to read.*

We changed figure 8 as recommended. The caption is changed to read: «A diagram showing the condensation sink, CS, as a function of the geometric mean diameter of the aerosol mode,  $d_{p0}$ , and the particle number concentration,  $N_0$ , for  $\sigma_0 = 1.5$ .»

*Figure 9: line types dashed and dotted are hard to distinguish.*

We agree with the comment and changed the line types in figure 9.

**Editorial comments:**

*Page 2, lines 18/19: "...affects little the particle growth" (delete "to")*

We changed this point as recommended.

*Page 7, line 27: "...showing that the mass..." (delete one "the")*

This sentence has been changed due to the comment of the other reviewer.

*Page 9, line 6: "...time scales..."*

We changed this point as recommended.

We thank again the referee for the useful suggestions. We hope that you will find that the present manuscript addresses all the comments raised.