RC2

Very interesting paper because the generation methods are always needed for the experimental works in aerosol science.

We thank the Reviewer for the valuable comments, we reply point by point directly in the test (blue lines):

I have only few remarks to help the readers.

Line 63 NaCl 0,9 % is it by volume or by weight?

The concentration of the physiological solution (i.e. normal saline) is commonly expressed by weight per unit volume. We changed the text writing: NaCl 0.9 % w/v.

CFU ml^{-1} should give how many CFU in air in the best conditions?

This actually refers to the concentration of CFU in the physiological solution (to be sprayed in the chamber).

Page 3 line 80 Collison nebulizer can be supplied in non-recirculation mode with a syringe pump.

The Reviewer is right however, we had such limitation with our nebulizer. We added the Reviewer comment in the revised text as follow:

Line 85: *"It is worthy to note that, differently from the specific model used in this work, some Collison units can be operated in not-recirculation mode by a syringe pump."*

Line 90 inch is imperial unit. Why not cm?

We modified the text as follow: *"..(fixed size 0.025 cm diameter).."*

Page 5 line 140 too many different units are used cfm; standard CFM; lpm; °C; K. I would suggest to keep lpm (1cfm = 28.4 lpm) and °C rather than Kelvin.

Thanks for the note: we made uniform the units throughout the text.

Page 6 line 175 blam slag produce how many particles /cc ?

With the impinger we assume to collect all the nebulized particles in the 20 ml of physiological solution inside the impinger. The concentration of viable particles (i.e. CFU) in the solution therefore depends on the liquid volume and we did not consider this number too informative. We couldn't measure the number of total bacteria (i.e. viable and not-viable) and/or other particles in the nebulizers output flow.

We could roughly estimate the conc. of injected viable bacteria in the chamber but we did not have the possibility to directly measure/control losses on the walls and on the inlets. Through the text, we refer the collected CFUs (both in impingers and in the petri dishes inside the chamber) to the CFU concentration in the injected solution x the injection volume/time.

Line 209 cambre should be chamber.

Done.

Page 4 line 113 remove the dot after 2.1

Done.

Page 4 line 126. The temperature accuracy unit is not given. Is it 0.2% or 0.2 °C?

The temperature accuracy unit is ±0.2 °C at 20 °C. We have modified the text accordingly.

Page 5 and others. The pressure is given in mbars. This unit is not legal unit. The pressure must be given in Pascal. The authors can add between parenthesis mbar if they want.

We have modified as suggested the pressure units.

Page 5 line 149. 'The pressure in the ChAMBRe arise from 10-5 mb to atmospheric pressure with air (I guess)' . A precision should be given about this air? Is it atmospheric air (called lab air) or air from a cylinder? If lab air is used then the authors should precise the RH. Indeed it seems that they are not using any drying system.

As the Reviewer points out we use "lab air", i.e. we have a drying/filtering system, which reduces the R.H. to about 15%. We added this information in the text.

Page 5 line 153. The pressure given is little bit incorrect 990 and 1020 bars are too high as pressure. I guess that the unit is mbars (again).

Yes, it was a material mistake that we corrected (and we moved to IS units).

Page 7 line 203. What it means PM10? The size distribution is monitored with an optical particle counter. That will be very nice to give more details on the measured distributions since the OPC gives them. Are they reproducible? What is the sigma g of the distributions? What is the density value used to calculate this relatively high mass concentration (200 mg/m^3) from the number concentrations given by the OPC? 200mg/m3 seems monumental form me.

We are sorry for a second material mistake: actually, we got 200 microg/m3 and not millig/m3, We corrected the value in the revised text. The OPC signal is dominated by the NaCl particles of the physiological solution: The size distribution turned out to be quite stable even if quite disperse. In one single experiment with the BLAM (not quoted in the text), we observed by a SMPS that the large majority of the particles are smaller than 100 nm.

The sampling experiments in the ChAMBRe are conducted by gravitational settling. The gravitational settling of a particle of 1 µm is 3.5 10-5 m/s in still air. I think that your method penalizes the generator. I would prefer a single stage bio impactor if I had to carry these experiments.

In our chambers, the lifetime of 1-micron particles is around 5 hours (Massabò et al., 2018) and we designed our experiments accordingly. In the future, we'll also test the use of bioaerosol impactors.

The short conclusion of the paper is not giving the results of each generator clearly. It will be better to give the concentration 5CFU/m3 for each generator to help the reader. It will be good to recall the concentrations at the outputs of each generator always to help the reader.

See our answer above to the Reviewer question at page 6, line 175. In the present configuration we cannot measure the bacteria concentration inside the chamber and therefore we anchored to the reference of CFU in the injected solution times the injection volume. We

could quote the CFU concentration at the nebulizers outlet but we could be misleading since it could be just proportional to the final concentration inside the chamber volume. The aim of our experiments was to assess the reproducibility of the whole procedure while ensuring a good statistics for the counting on the petri dishes placed at the bottom of the chamber (and finally to demonstrate the sensitivity to possible changes of bacteria viability with polluted atmospheres). We consider such achievement as a good starting point for further future improvements.

I would suggest to add one paper at least on bio aerosols and atmosphere (for example Joung 2017 : Bioaerosol generation by raindrops on soil: Nature communications 8 : 14668)

We added the reference at line 71.