The authors thank referee 1 for the careful review.
We will address the points (in italic) below:

1) The order of paragraphs and ideas in the introduction is somewhat haphazard, making for a quite confusing read. I suggest the authors careful lay their ideas in a comprehensive ordering

We have tried to improve that section. In particular, we now added some text to explain what each paragraph is about to make the structure more clear.

2) The authors might want to consider adding a schematic or similar to the discussion of their implementation in section 2; that might make it much easier to follow exactly what the authors have done

This is a good idea. We created a flow chart showing the steps for dry and wet deposition calculations in forward and backward mode.

3) The authors on multiple occasions state that results are 'similar' (e.g. page 5 line 20, line 30). Can this 'similar' be quantified? Is it possible to use some statistical tests to assess whether the two experiments are statistically indistinguishable?

In the manuscript we already have a table which shows for each model simulation pair (forward and backward) how many points fit within a certain percentage. Additionally we perform correlation analysis for each pair of forward and backward simulations, R is always above .89, which gives a significant correlation with p<0.001 in all cases. We also added this information in the text.

4) Section 5 is at points particularly confusing. I is not clear why a MFB=-51% is considered accurate (page 8, line 18), while an MBF=-36% is considered an underestimation (page 8, line 30). Also this section would likely benefit from a map of these MFBs, as a new Figure perhaps

As stated in the text (page 8 – line 26), the MFB can take values between -200 to +200. Therefore, both MFBs -51% and -66% show an underestimation of the model with respect to observations. Given the rather large uncertainties related to both modelling and observation of BC in snow, both values are actually not indicating a too bad agreement. We corrected a typo, it should be -66% rather than -36% and reformulated the respective sentences to be clearer now.
Concerning a map of FB, we created one and put it as S2 and added a reference to the Figure in the text.

Furthermore, I also have some minor comments
- In the first paragraph of the introduction, this depends on the interpolation scheme used, I assume?

We are not sure to which statement in the first paragraph your question refers to, so we cannot answer it. Sorry.

- Page 2, line 34: calling ones own research a milestone is a bit grand.

Indeed, this was an unfortunate formulation. We have changed this to:
... which would provide a very useful tool

- Page 3, line 2: Remove 'briefly' here

done.

- page 3, line 13: How can both interpolation schemes be equally accurate? Do the authors mean 'exactly the same' here? Surely that can't be the case?

This was perhaps not clear enough. The interpolation scheme is the same, but the coordinate systems are slightly different. We have rephrased this now to read:
"As the first meteorological input data set read into the model is different in forward and backward simulations, this can create small differences in the internal coordinate system used by the model, which can cause small differences in the interpolation of the meteorological data."

- page 3, line 30: This sentence is quite confusing and vague for someone who isn't

experienced with using FLEXPART
We reformulated and gave more details:

*"*The kernel assigns particle attributes to up to four grid cells, depending on the particle's position on the regular output grid (e.g., if a particle is located just at the boundary of two grid cells, both grid cells receive an equal fraction of the particle's attributes).*"*

- page 4, line 8: how shallow is 'shallow' here?

To explain this, we have added the following text in the manuscript:
"The height of this layer is equal to the height of the layer in which, in forward mode, particles are subject to dry deposition. By default, this height is 30 m, which is within the constant flux (surface) layer most of the time."

- page 6, line 8-13: Are there any references from the literature here that can be used to back up these claims?

Indeed, it is good to give references here. We have added "(see discussions on this topic in Seibert and Frank, 2004 and Lin et al., 2003)", as to our knowledge these are the only two papers discussing this.

- page 7, line 7: refer to Figure 4 here?

yes, we added a reference to Figure 4 to make it clear.

- page 9, line 4: so the sources from Canada are definitely not anthropogenic?

The fact that all other years except 2007 are captured well probably means that a specific source was active only in 2007. Given that anthropogenic emissions are more or less constant with time, we believe that the fluctuation is due to biomass burning emissions, which have been adopted from GFED. It has been shown in detail in the literature that changing certain parameters on how one calculates biomass burning from satellites, may lead to large discrepancies in the burned area calculation and hence in the final emitted mass. A very good example is Hao et al. doi:10.5194/gmd-9-4461-2016 (see Figure 2).

- page 9, line 10: I am surprised there is no source at all from shipping (i.e. over the ocean). Is this a limitation of the technique? Or are there really no Black Carbon sources from shipping?

The source of shipping in the emission inventory that was used to calculate BC in snow (ECLIPSEv5) is 0.6 Tg/year or 6.4% of the total annual emissions of BC from ECLIPSEv5 (~9.3 Tg/year). Furthermore, most shipping emissions occur far from where the samples were obtained (on Arctic sea ice and on land-based snow). While small contributions are present, they are, in fact, much smaller than their relative share of global emissions and are therefore not visible in our source contribution maps.

- Figure 7: What is plotted on the background in this Figure?

Both Figure 7 and 8 were created using the free Python's package Matplotlib. As the reviewer may see here:https://matplotlib.org/basemap/users/geography.html the background is NASA's bluemarble image. We added a reference to this in the figure caption

- Figure 8left: is the unit here really in nanosecond per cubic meter?

The units in Figure 8 were accidently set to the units of an air concentration ES. We correct this to the units m and now it is homogeneous through the manuscript.

Type-os etc:
- Page 1, line 26 & 32: replace 'Firstly' and 'Secondly' with 'First' and 'Second'
done.

- page 5, line 18: 'extends over the entire atmospheric column'

done.

- page 6, line 6: 'with increasing number of particles'?
correct. done.

- page 7, line 21: Is 'nice' the right word here? Something more technical?
We changed this word to "useful".

- page 7, line 23: Is 'folding' a type-o?
we meant multiplying, we replaced folding by multiplying.