On behalf of all authors, we would like to thank you for reviewing and giving feedback on our manuscript. Below are our responses to the specific comments:

1. *The Shershakov et al. (2019) reference on Table 1 is uncompleted. Please, complete or remove this reference from the Table*

   Thank you for pointing this out, we have completed the table.

2. *Line 210: Table 1 shows highly different source terms. Why was the source term from Saunier et al. (2019) chosen? Were the others also tested?*

   The Saunier et al. (2019) source term was chosen since it is contains a clearly described temporal release profile. We did not explicitly test other source terms. For the twin experiments, the choice of source term is arbitrary as it is used to generate the synthetic observations.

3. *Table 5 wasn´t called anytime in the text. Please, identify each acronym and explore better those scores. What does explain the better correlation for the rain water experiment? Lines 244-245*

   Thank you for highlighting this. Non-discussed metrics in the table have been removed and the table is now referenced in the text with a description of each metric. "*What does explain the better correlation for the rain water experiment?*" We do not know whether the difference is due to the collection method or other sources of error such as the source term or the model itself.

4. *Line 311: "These releases thus have a small effect on the deposition values". Is the released quantity the only effect? Could the atmospheric conditions like wind speed and direction or atmospheric stability simulated by the model impact this result? Could the first partial release detected by the inversion method related with the wet deposition (Sep, 25th), in truth, refer to the release of the 2 previous days? Could the same release result on significant deposition values for a less favorable dispersion condition?*

   In principle this is indeed correct: the deposition is not only proportional to the release quantity, but also the source-receptor-sensitivity which is influenced by the atmospheric transport itself. The source receptor sensitivities for the earlier and main releases are however of similar magnitude. Therefore the release amount, being two orders of magnitude lower, is the dominant factor in the release profile.

5. *Line 392: "We found an unexpectedly large impact of the resolution of the meteorological data in Sweden". Why unexpectedly? Since higher resolution modelling can simulate better the physical processes, especially within the Planetary Boundary Layer, the improvement is totally expected. Please, rewrite this phrase.*

   We have altered the language used here. However, we would like to clarify that both models are extracted from the same underlying meteorological data, only pre-processed in different resolutions for use with Flexpart. We have now also mentioned this explicitly in Sect. 2.2.