

Answer to reviewer n. 2

We thank the referee for his review, his comments are reported in *Italic* before our answers.

- *“...Overall it is a very nice paper covering several different aspects of the Lagrangian stochastic dispersion model. One weakness is that it lacks the comparison with measurements or real data. Some actual measurements could shed more light on the model’s performance.”*

The present model has been developed for climatological simulations and we think that in this context the model comparison approach is a good way to validate it. Direct comparison with observations would be difficult, since the driving NorESM model is free-running and not made to reproduce a particular meteorological situation.

- *“...new routines were added for FLEXPART to read in and/or modify the NorESM outputs. It is a bit questionable that such modifications have enough originality. However, the model inter-comparison provides some insights into the model and will be helpful for future users. The title and abstract could emphasize more on this part rather than the FLEXPART-NorESM/CAM(V1) itself.”*

We provide a Lagrangian model diagnostic tool for the NorESM climate model that can be used in e.g., future climate projections or paleoclimate studies. Moreover, it is our hope that the model tests and comparisons will provide a useful reference for future users of our model and more generally for users and developers of Lagrangian models. We think that the title is representative of the content of the paper.

- *“The comparison between Lagrangian and Eulerian models in the first paragraph of the Introduction is somewhat biased. It is better to state that both models have their advantages and disadvantages.”*

We added, in line 1 of the introduction: “...and both modelling methods have their advantages and disadvantages”.

- *“Inline coupling of WRF and HYSPLIT, published in 2015 (shown below), is a very relevant work and could be mentioned here. Inline Coupling of WRF-HYSPLIT: Model Development and Evaluation Using Tracer Experiments. Fong Ngan, Ariel Stein, and Roland Draxler, 2015. J. Appl. Meteor. Climatol., 54, 1162-1176. doi:http://dx.doi.org/10.1175/JAMC-D-14-0247.1.”*

Thanks for pointing out this interesting paper. A reference has been included (page 8, line 5), reading: “An integrated solver is generally more consistent with the dynamics of the model than a post-processor (see e.g. Byun, 1999, Ngan et al., 2015) ...”. Notice, however, that FLEXPART-NorESM is not coupled on-line to NorESM.

- *“Appendix A is probably unnecessary here.”*

We prefer to include Appendix A for completeness.

Specifics:

- *“Abstract, “However, for both model versions there was some degradation ...”: What degradation means here need to be specified.”*

We specified in the abstract: “...with the buildup of a bias and an increased scatter” (page 1, line 27).

- *“Page 8, line 10: Please describe what the emission rate is and how many particles were released here?”*

Results are shown for an emission rate of 1 kg s^{-1} . The number of particles used in the FLEXPART simulations was nine hundred thousand. The particles were emitted over a week for the continuous release (plume) and over 30 minutes for the almost instantaneous release (puff). Similar comments have been included in the paper (page 8, lines 25-27).

- *Page 16, line 11, (Fig. 2 and 6, right panels): They should be the left panels.*
Corrected (new page 17, line 1).

- *Page 24, line 11: Remove "both" from "and both with the ..."*
Corrected.

- *Page 28, table 1B: Add "Unit" at the top of column 2.*
Added.