[GMDD]

Interactive
comment

Interactive comment on "The Lagrangian particle dispersion model FLEXPART version 10.3" *by* Ignacio Pisso et al.

Anonymous Referee #1

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FLEXPART is a well-known Lagrangian particle dispersion model that has been used in various applications. The new version presented here has some very important updates such as considering the skewness in the vertical velocity distribution and adding option to start backward runs from depositions. The manuscript clearly described the new features and provided detailed information for the usage of the whole software package. It is well organized and presented.

Major points:

In parallelization section, the test examples have 40 million particles released. It is not quite practical to have that many particles in some applications. As it has been pointed out, the speedup highly depends on the number of particles released. Can the authors add examples with less particles (less than a million)?

In section 3.3, the authors commented that a direct comparison between serial and parallel version is difficult. Is it a viable way to specify random seed numbers explicitly in the two versions?

Figure 9 might be redundant as the information has been well described in text.

Minor points:

Page 1, lines 5-6: Note that "volcanic emissions" are not "atmospheric gases and aerosols" for which the examples are given. Consider to replace it with "volcanic ash" or something else.

Page 2, line 3: "since many years" -> "for many years" or "since many years ago"

Page 5, line 33: It is not accurate to state that all Eulerian models have the tracer instantaneously mixed within a grid box although most of them do.

Page 6, line 3: The term "air history" is confusing. It should be changed.

Page 7, line 22: Fluxes across grid cell center "lines"? Are they supposed to be "faces"?

Page 11, Figure 1: The figure is not easy to read. Can it be changed to color-filled contour flood style?

Page 15, Equation (7): It is easy to mistake iC_r as two variables, i and C_r. Can it be changed?

Page 21, line 1, "For a, say, 10-day ... ": It is better to replace it with "For instance, a 10-day ...".

Page 15, line 15: It is not clear how the emissions are defined here. Are they assumed constant over the entire simulation period?

Page 24, Figure 5: Is the unit of molecules cm^{-3} $x10^6$ considered mass based? It would be good to add a sentence or two to comment on units like this.

Page 30, Table 4: It is strange to have the parallel efficiency greater than 1. What is the reason for that? Are multiple realizations needed to have robust numbers? In addition, It might be better to leave the column with 1 process blank than to fill it with 1.00 or 1.000.

Page 38, line 9: Is there a typo here with "LOWER release height ABOVE 0.5 m"?

Page 43, Table 9: It is better to have "mixing ratio" appear in the description for "grid_pptv_date_nnn" (row 6).

Page 44, line 19: The file name has been cut.

Page 45, Table 10: The values of 3 and 4 are shown here for "ind_receptor", but they are not listed in Table 6 as possible values. They need to be consistent.

Page 47, line 6: Flexpart -> FLEXPART

Page 47, line 30: Group 10 -> Group ten

Interactive comment on Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2018-333, 2019.