



EGUsphere, author comment AC1
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Reply to RC1

Lucas Schauer et al.

Author comment on "Parallelized Domain Decomposition for Multi-Dimensional Lagrangian Random Walk, Mass-Transfer Particle Tracking Schemes" by Lucas Schauer et al., EGU sphere, <https://doi.org/10.5194/egusphere-2022-781-AC1>, 2022

The journal aims and scope clearly indicate that the purpose of GMD is to allow publication of papers regarding numerical simulations of earth system components. The diffusion and/or heat equation are ubiquitous throughout the vast coupled partial differential equations typically used to describe earth system process. If this were a "Model description paper" then the reviewer's position could be considered correct. However, we point to the description of GMD manuscript types (https://www.geoscientific-model-development.net/about/manuscript_types.html#item2), which, for "Development and Technical papers", specifically invites "...model improvements such as the speed or accuracy of numerical integration schemes...". This is precisely what is done in our submission. The problem of efficiently solving interacting, Lagrangian particle simulations is difficult, and we offer an approach with scalable efficiency across parallel computing architectures (multi-processor and multi-node clusters). The approach also offers the unique and novel ability to predict scaling behavior, which is especially difficult in most complex, parallelized models. These reasons clearly support inclusion of this work in GMD as it is 1) within the overall scope, and 2) specifically fits within the defined article types.