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Interactive comment on "A mask-state algorithm to accelerate volcanic ash data assimilation" *by* Guangliang Fu et al.

Anonymous Referee #2

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Referee report for the paper by G. Fu et al, called "A mask-state algorithm to accelerate volcanic ash data assimilation".

After reading the manuscript in detail I found the scientific content of the paper very minimal, and as such I am not in favour of publication in GMD. The authors published the ash assimilation approach and results in an earlier paper (Fu et al., ACP 2016). Compared to this earlier work I obtained very little extra knowledge from this new paper.

The main purpose of the paper is to show how the computational speed of the volcanic ash assimilation approach can be improved. This topic by itself is very technical, and arguably does not belong in the "geoscientific" journal GMD. The results may justify publication if the approach would be applicable to a large class of assimilation problems, but this is not the case as mentioned by the authors themselves. Using masks is

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Discussion paper

only applicable for a very limited set of problems, typically single point source releases of short-lived species. The problem is very idealised, with only a few observations (m=2). In this case the whole inversion problem in “observation space” is computationally very fast, which normally is not the case. The most costly step identified by the authors is a simple matrix multiplication, Aˆa = Aˆf X. Such a simple step should be very easily distributed over the available CPU’s and should be very fast, so in fact I do not even understand the “problem” that the authors want to solve.

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