

## ***Interactive comment on “Comment on “Reduced efficacy of marine cloud brightening geoengineering due to in-plume aerosol coagulation: parameterization and global implications”” by S. Anand and Y. S. Mayya***

**S. Anand and Y. S. Mayya**

anandsmudhaliar@yahoo.com

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### **Comments from Anonymous referee (Referee 1)**

In this Comment manuscript, the authors compare their modeled estimates of the fraction of aerosol particles surviving in dispersing plumes with the estimates of Stuart et al. (2013) (S13) who used a multi-shelled Gaussian plume model. They find that in spite of using different modelling approaches, the resulting survival fractions are typically similar. This Comment paper is generally well written, and it is heartening that in

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spite of the disparate approaches, the results are so ‘remarkably close’. This broad validation of the earlier paper’s modelling is valuable. While it is my opinion that this paper deserves publication, one specific suggestion is made below. While it is appreciated that this work has a wide range of applications, for completeness, it is suggested that it would be worthwhile for the authors to refer back to the main focus of the S13 study and briefly comment on whether their results support (or otherwise) the overarching conclusions of the S13 paper. Namely, the main conclusion of the S13 paper was that including a representation of such aerosol processes in global-scale models would be important for the realistic representation of marine cloud brightening geo-engineering in global-scale models, and that its omission could lead to overestimates of the technique’s potential effectiveness. In light of apparent growing interest in geo-engineering, reflection upon this specific point may be worthwhile.

### **Author’s Response**

We thank the referee for his encouraging comments, and his suggestion is taken care in the revised manuscript.

### **Author’s changes in manuscript**

The number survival fraction estimated from the present model varies from 0.36 to 0.62, thereby confirming the important role of aerosol microphysical processes as envisaged by S13, in significantly altering the source to receptor transfer of particles for cloud brightening applications.

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