

Response to Dr. Manish Shrivastava

We thank Dr. Manish Shrivastava for handling the review process of our manuscript and his careful reading and review of our manuscript. Our detailed responses to his comments follow. The comments are in blue, our responses are in black, and our corresponding revisions in the manuscript are in red.

General comments:

Please clarify the specification of size range of emissions for MOA/Sea salt in primary carbon versus accumulation mode and how it is reported based on model calculations in MAM.

We thank the editor for the comments, we have revised the Table 1 following your comment. We have added the explanations for size ranges in Table 1, and the revised caption for Table 1 reads:

Table 1. Aerosol species in MAM4 modes

	Accumulation	Aitken	Coarse	Primary Carbon
Species ¹	num_a1, so4_a1, pom_a1, soa_a1, bc_a1, dst_a1, ncl_a1, moa_a1	num_a2, so4_a2, soa_a2, ncl_a2, dst_a2, moa_a2	num_a3, dst_a3, ncl_a3, so4_a3	num_a4, pom_a4, bc_a4, (moa_a4 if externally added)
Size range ²	0.08 – 1 μm	0.02 – 0.08 μm	1–10 μm	0.08 - 1 μm
Standard Deviation σ_g	1.6	1.6	1.2	1.6
Number-median diameter D_{gn}	1.1×10^{-7}	2.6×10^{-8}	2.0×10^{-6}	5.0×10^{-8}
Low bound D_{gn}	5.35×10^{-8}	8.7×10^{-9}	4.0×10^{-7}	1.0×10^{-8}
High bound D_{gn}	4.8×10^{-7}	5.2×10^{-8}	4.0×10^{-5}	1.0×10^{-7}

¹so4_aX: sulfate mass mixing ratio in mode X; pom_aX: particulate organic matter (POM) mass mixing ratio in mode X; soa_aX: secondary organic aerosol (SOA) mass mixing ratio in mode X; bc_aX: black carbon (BC) mass mixing ratio in mode X; dst_aX: dust mass mixing ratio in mode X; ncl_aX: sea salt mass mixing ratio in mode X; moa_aX: marine organic aerosol (MOA) mass mixing ratio in mode X; and num_aX: number mixing ratio of mode X. *_a1: accumulation mode; *_a2: Aitken mode; *_a3: coarse mode; and *_a4: coarse mode.

²The size ranges are only used for sea salt and MOA emissions. MOA emitted in the size range of 0.08-1 μm is assigned to the primary carbon mode or accumulation mode, depending on the mixing state of MOA with sea salt (Burrows et al., 2018).