

# Author Response and Manuscript Revision

Sonya Fiddes

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## Editor comments

*I concur with all three reviewers that this is valuable work, addressing a key source of uncertainty in climate models. All three reviewers request clarifications to the text that may help readers better understand the methodology used, as well as the robustness and interpretation of findings. I agree with Reviewer 1 that it would be valuable to explain whether recent GLOMAP-mode aerosol scheme updates should be expected to impact model performance compared with the version analyzed here. Thank you in advance for your work to address reviewer comments.*

Dear Dr. Ann Fridlind

Please find our response to the Reviewer's comments and our revised manuscript with an updated title: 'The ACCESS-AM2 climate model underestimates aerosol concentration in the Southern Ocean; improving aerosol representation could be problematic for the global energy balance'. We have addressed each comment in detail, including specific comments as to the model updates. We have spent considerable effort on clarifying the text and figures to make them more readable and easier to understand. I (Sonya - lead author) would also like to thank you, the Editor, the journal and the Reviewers for your patience and support while I was on parental leave.

Kind regards,

Dr. Sonya Fiddes