

Interactive comment on “A new model of meteoric calcium in the mesosphere and lower thermosphere” by John M. C. Plane et al.

Anonymous Referee #2

Received and published: 29 September 2018

This manuscript describes WACCM simulations of Ca, Ca⁺ density variations, based on substantially improved Ca reaction kinetics and experimentally-based Meteoric Input Function, and comparisons with lidar and rocket measurements. The goal is to find an explanation for the extremely large depletion of Ca compared to Na and the unusually large Ca⁺/Ca ratio. Based on the new understanding of the chemistry, it is proposed that this is due to very stable CaOH and CaCO₃ which act as a reservoir of Ca.

The manuscript is well-written, with a very clear explanation of the proposed questions, and they are well supported by the WACCM simulations and observations. I recommend it to be published as is, and only have a few minor questions/suggestions listed below.

P1, L19-20, and P11, L16-17: These sentences do not state which ablation is larger, Ca or Na. It's better to state that explicitly, although it is mentioned in P3, L4. The sentence can be simply changed to "... 1 order of magnitude larger than Na"

P4, L16-17: Please explain why 100 times increase is used instead of some other factor.

P5, L18: 200 km is a closer to the WACCM resolution at 1.9 degrees.

P11, L2: It's simpler to just use '11.0' instead of '11.0:1'

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2018-493>, 2018.

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