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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Simultaneous aerosol measurements of unusual aerosol enhancement in troposphere over Syowa Station, Antarctica" *by* K. Hara et al.

Anonymous Referee #1

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This manuscript reports two cases of elevated concentrations of aerosol particles larger than 0.3 um in diameter over the Syowa station in Antarctica. While the paper appears to be scientifically sound, it fails to provide sufficient amount of new scientific knowledge to warrant publication. My main criticism in this regard is summarized below.

The motivation, scientific goals and final conclusions of this paper are vague. The authors state in introduction (large paragraph of it) that ". . .high concentrations of sea-salt particles. . .can affect. . ." and again in conclusions ". . . can affect material cycles". This is not a solid enough motivation for a scientific paper. As the goals of this paper the authors simply state that they aim to elucidate the Antarctic haze phenomenon and

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shed new light on its vertical structure.

The paper is a report of observations rather than a scientific analysis. The only new observation is that >0.3 um particle (sea salt) is observed in two occasions at altitudes up to 4 km. The meaning and value of this observation remains open. Even the authors state in concluding remarks that “The twice simultaneous measurements in this study, however, are too short to elucidate the occurrence of Antarctic haze, or to estimate. . .”.

Yet another problem with the paper is that the measurements were limited to particles >0.3 um in diameter. This size range is fine for the sea salt particle mass or surface area concentration, quantities that were not reported here at all. The number concentration of particles >3 um is not a very useful quantity as it represents only a subset of the number concentration of sea salt particles, and a negligible subset of the total particle number concentration.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 26269, 2013.