

## ***Interactive comment on “Satellite observations of aerosol transport from East Asia to the Arctic: three case studies” by M. Di Pierro et al.***

**Anonymous Referee #2**

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General comments This paper presents a study on the long-range transport of aerosols from East Asia to the Arctic using the satellite observations together with models. Authors examined three observed transport cases by the CALIOP lidar onboard CALIPSO to show the dominant pollution transport pathways from East Asia to the Arctic and the general synoptic meteorological conditions over the NW Pacific. By comparing with model results the authors confirmed the sources of transported aerosols and their main chemical components based on the general good agreements between the model and the observations. This manuscript includes interesting and important results that are worthy of publication. The paper is generally well written but can be improved from careful editing for language. I recommend that relatively minor but important revisions be made in the paper before acceptance.

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Specific comments – 25359, 18: percent should be removed! – 25404, 14: “likely underestimates the dust in the model”, Any possible reasons for this? How does the GEOS-Chem simulate the wet scavenging of dust aerosols? This might worth a little bit of elaboration because the long-range transport from East Asia accompany in general wet processes such as the warm conveyor belt and deep convection as the authors indicated. – 25405, 7: The mixing state of aerosols affects aerosol extinction according to the previous literature. Wonder if any effects of the assumed external mixing in the GEOS-Chem on the discrepancy shown here. – 25407, 21: asian => Asian, but here and elsewhere, careful editing is highly recommended. – 25408, 21: Is there any particular reason why the authors use the WP and PNA indices? – 25410, 10: It would be appreciated if the authors explained reasons for the strong seasonal dependence of correlation coefficients. – It is difficult to see the map and color shadings in Figs 1, 5 because they are too small. – Also labels and inset are too small to read especially in Fig 4.

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