

Interactive comment on “Asian dust outflow in the PBL and free atmosphere retrieved by NASACALIPSO and an assimilated dust transport model” by Y. Hara et al.

Anonymous Referee #1

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Hara et al. represents a diagnostic study of a long-range Asian dust transport. It combines different data sources (ground and space-born lidars, and model simulation) in effort to describe in details the transport process features. The authors show that the process is mainly driven by low-pressure systems and that, depending on the atmospheric circulation conditions, a low- or high-level transport may occur. The study also demonstrates that use of the 4-D VAR assimilation of lidar data improves the accuracy of the dust model. Finally, the dust aging and dust relative contribution in the aerosol mixture (with sea salt and sulfate) is analyzed using lidar depolarization and color ratio data. The authors managed, successfully in general, to present in descriptive, tabular and graphic way the 4-D structure of the complex dust process.

This paper presents novel and interesting approach in studying the phenomenology of the long- range dust process. I therefore recommend it for publishing, but after considering some specific comments listed below.

Specific comments:

My general impression is that a reader could have difficulties to follow all the facts and descriptions presented in the paper. Certainly this was a challenging task to describe all the complexity of the process and to put together all the available information. However, providing more concise description in the Results and discussion may improve the readability of the article.

P8718, line 10: I guess "zero initial.." relates to the cold-start of the model for the first-day simulation. Please clarify.

P8720, lines 4,5: Use of symbols L and UTD is not clearly explained

Fig. 2 should be completely restructured. It contains a low-quality background cloud information, and in addition, wind arrows and isolines are not easy readable.

P8728: CMAQ results are mentioned. Clarify if you made a CMAQ simulation for the case, in addition to the RC4 runs, or you just make a reference to CMAQ in general.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 8715, 2008.

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