

Interactive comment on “Selected topics on interactions between cirrus clouds and embedded contrails” by K. Gierens

Anonymous Referee #1

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This paper is a short note that addresses some specific yet interesting questions relevant to contrail and cirrus research. Although the approach used is purely analytical and may oversimplify certain aspects of the problem (this is acknowledged by the author when needed) I think it is an original and welcome contribution to the topic and recommend publication with only minor remarks I hope the author may want to take into account.

I found the answers to the first and second questions and, to a lesser extent, the third question, rather intuitive, yet the author has the merit to provide elegant explanations using appropriate timescales for the different processes involved. The answer to the last question- the enhancement of contrail dissolution by aggregation of ice crystals from cirrus clouds- is very interesting, could it be used to explain available observations

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of aged contrails embedded into cirrus?

Minor remarks

1) It could be worth adding a paragraph explaining whether and how this analysis can be helpful in the modeling and simulation of contrails-cirrus but also when modeling contrails into global models. For example, the fact that cirrus do not affect contrail formation can be seen as an a posteriori justification of the implicit assumption made in global models to treat contrails and natural cirrus as separate entities at the scale of the grid-box. 2) There is no reference to Gierens and Spichtinger 2012 page 25239. This study relies on numerical simulations and complements the present analysis, so if it is not yet published it would be worth to adding a few words explaining what it is done there. 3) You may want to mention that t_{jet} characterizes the mean dilution in the jet. 4) Consider increasing the size of Figure 1, I can hardly see the characters.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 25237, 2012.