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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Fast transport from Southeast Asia boundary layer sources to Northern Europe: rapid uplift in typhoons and eastward eddy shedding of the Asian monsoon anticyclone" *by* B. Vogel et al.

Anonymous Referee #3

Received and published: 7 August 2014

This study presents results of a trajectory analysis designed to identify the source of air with tropospheric properties sampled aboard a high-altitude research aircraft in the lower stratosphere over Northern Europe. The chosen presentation of the analysis greatly aided the interpretation by the reader and I find the study novel and worthy of publication. In particular, several pathways that contributed to the observed characteristics in the trace gas measurements were clearly outlined and justified. Some of the particles coincided with rapid ascent in the vicinity of a tropical cyclone and subsequent transit into the lower stratosphere via breakup of the upper level monsoon anticyclone,

for which the theme of the paper is dedicated. The interaction between these transport processes and scales and their role in stratosphere-troposphere exchange is an important focus of future study and this paper is an excellent addition. I recommend accepting the manuscript for publication once revisions in response to the following minor comments are complete.

Comments:

Page 18466, line 25: "step" should be "steep"

Page 18467, lines 6-7: Reproducibility in what sense? Can you explain in more detail why this is important?

Page 18469, line 17: It would be clearer here if you state "particle trajectory paths from two Θ_{org} intervals" rather than "two Θ_{org} intervals"

Page 18469, lines 27-29: Please reword. $\Theta_{org} <$ 320K implies that the particles originate at much lower levels.

Page 18471, line 11: "closed" should be "close"

Page 18471, line 21: "extend" should be "extent"

Page 18474, line 21: "an other" should be "another"

Figures: It is not clear where the PV, wind, potential temperature, and geopotential heights come from in each graph since both CLaMS and ERA-Interim are discussed in the text. Please provide more information in the captions were applicable.

Figures 3-5: The font size in these figures is quite small. Please increase to a readable size.

Figure 3, bottom: In the caption the description of this time axis says "(in UTC)", but I am not familiar with the value form in the figure. What do these numbers represent? Wouldn't it be clearer to label the axis by trajectory day number (as colored in the

middle panels)?

Figure 4: Please show the position of the cross-section on the map.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 18461, 2014.