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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Long range transport of mercury to the Arctic and across Canada" *by* D. Durnford et al.

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Specific comments: 1. p. 3, line 1. I've adjusted this paragraph.

2. p. 3, lines 31-33. Although I realize that the transport of mercury to the Arctic is implicit the studies described in Christensen et al. (2004) and Dastoor et al. (2008), these articles focus on the impact of AMDEs in the Arctic rather than the long range transport of mercury to the Arctic. Therefore, I don't feel they belong in this list. Bullock et al. (2008) concentrate primarily on model processes on a regional scale. Although they discuss the sensitivity of the regional models' results to the lateral boundary conditions, which implies transport processes, transport pathways are not explicitly discussed. Pan et al. (2008) do calculate the amount of mercury leaving their region of interest. However, they do not indicate where the mercury leaving the region is head-

ing or even which model boundary is crossed the most often. Seigneur et al. (2001) and Selin et al. (2007) discuss distributions of mercury concentrations and deposition fluxes without explicitly discussing transport; I don't consider the calculation of the contribution of North American anthropogenic mercury emissions to total deposition over North America in Selin et al. (2007) as a discussion on transport. So, while I appreciate and understand your suggesting these articles to add to this list, I have chosen to keep the focus of this list strictly on articles discussing transport pathways rather than also including articles on distributions of mercury concentrations and depositional fluxes that imply but don't explicitly discuss transport.

3. p. 4, line 31. I've added more text in Section 2.1.2 to describe the coupling.

6. p. 15, line 11. Thanks for noticing that 516 sigma should be 0.516! In the end I decided to move straight to pressure levels so that I wouldn't have to get in to a detailed description of the model's vertical coordinate system. See the first paragraph of Section 3.2.1.

5. I have divided Figs. 4 and 6, assigning each transect to its own page. Fig. 8 has been divided, using one page per source region. I thought that the interpretation of the information in the original figures might be aided by the addition of a new figure. The new Fig. 7 represents geographically the numbers of LRT events received at individual stations from the four source regions over a year, as given in Table 3. Text describing this figure was added to Section 3.1.5.

Technical corrections: 1. p. 4, line 30. Thanks for pointing out this conflict. I renamed the acronym of the GEM model to GEM-GDPS.

2. p. 4, lines 25-26. Quite!

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 4673, 2010.