

***Interactive comment on “Atmospheric transport of persistent semi-volatile organic chemicals to the Arctic and cold condensation at the mid-troposphere – Part 2: 3-D modeling of episodic atmospheric transport” by Lisheng Zhang et al.***

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We appreciate the constructive comments from the anonymous referee. We have revised the manuscript following the Referee's comments. In response to the referee, the questions/comments from the Referee are shown with Q and our answers are shown with A.

Q1) There are no obvious weaknesses or errors found in this manuscript. The authors  
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are directed to the papers of Hansen et al (2006, 2008) with regards to assessing the role of the snow pack in the Arctic for storing and releasing HCHs to the overlying atmosphere. These papers may help the authors account for the differences between their modeled results and the observed concentrations in the high Arctic, which, I suspect, are due to the lack of a seasonal snowpack in the modelled results. The snowpack exerts a significant influence on POP vapor concentrations in the arctic boundary layer and the authors may want to comment on this.

A1: In the manuscript, we did recognize that the lack of accurate parameterization of in the estimate of water/air, snow (ice)/air exchange processes may affect modeled air concentrations in the high Arctic. In the revised paper, we further state that “Hansen et al. (2006; 2008) provided modeling evidence showing that the presence and melt of snowpack in high latitudes and the Arctic results in seasonal increase in air concentration of SVOCs”. Two new references referred by the Referee are cited in the revised paper and added to the Reference list.

Q2) The authors should carefully check the written English before final publication.

A2: Efforts are made to polish English of the manuscript. Some typo errors have been corrected.

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