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Interactive comment on "Contribution of air-mass transport via the South Asia High to the deep stratosphere in summer" *by* Yu Liu

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First of all, thank the referee for reviewing my manuscript again. The replies to his comments and questions are as follows:

1. Equation (3) is derived from the three-dimensional mass conservation Equation (1). The purpose of comparing Equation (3) with Equation (4) (Andrews et al., 1987) is to further illustrate Equation (3), and is not to explain Equation (4).

2. Under the steady state, Equation (5) is obtained from Equation (3). Equation (5) means that the net input or output (on the left side of the equation) is equal to the sink or source (on the right side of the equation), which indicates that the mass is conserved. There is no assumption that "the transport is proportional to the mean

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gradient".

3. a represents the features of meridional transport (unit: 1 / s), b represents the features of vertical transport. F = a /(a + b) means the fraction of meridional transportation in the total transportation. This is consistent with the explanation in the paper. Therefore, the first term on the right side of Equation (10) indicates the contribution of meridional transport, and the second term indicates the contribution of vertical transport.

4. In introduction section, I introduced the work of Rendel et al.(2010). Since HCN is used as a tracer, Figure 1 is the same as Figure 2 of Rendel et al., but the depiction contents are different. Figure 2 is similar to Figure 1a of Rendel et al., but what I illustrate and discuss is different with that of Rendel et al. Their work shows that the ASM is an important transport pathway from the troposphere to the middle and upper stratosphere in summer. My job is to estimate the contribution of air-mass via the ASM into the middle and upper stratosphere.

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