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Interactive comment on "Impact of the regional climate and substance properties on the fate and atmospheric long-range transport of persistent organic pollutants – examples of DDT and γ-HCH" *by* V. S. Semeena et al.

Anonymous Referee #2

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Reviewer's Comments on "Impact of the regional climate and substance properties on the fate and long-range transport of POPs - Examples of DDT and -HCH"

General comments:

This paper presents a very comprehensive description of the processes of POPs in the atmosphere. The long time simulations (10 a) of DDT and lindane nicely illustrated the occurrences, distributions, transports and removals. Even though the simulation

scenarios are rather highly ideal, the results from these simulations show the possible limits of these two chemicals in the environments. The impact of regional climate on the POPs fate is well described and valuable.

Specific comments:

(1) Ocean module is too simplified. For a short period of simulations, the ocean transport may be not important. However, for 10 years or more simulations, oceans play a significant role in regulating the transport of POPs in the atmosphere. This is especially true for soluble species like -HCH. As we know that one of the most important transfer processes between compartments is the air-water exchange which depends on the water concentrations of the POPs. Without a realistic ocean module, the oceanic concentrations of the POPs may be far off the realistic values. This leads an unrealistic assessment of the transport, residence time and other properties of the concerned POPs. (2) Soil-Air Exchange. There is very little information about the soil-air exchange process and the processes of POPs within soil layers. The exchange process depends on the balance between two transfer processes: the chemical transfer between deep soil layers and surface soil, and the exchange of the chemical vapour between the soil surface and the atmosphere. The soil-exchange model [Jury, 1989; Jury et al., 1983] has been used in modeling the soil-air exchange fluxes of POPs. By using only the volatilization scheme in this paper without considering the mass transfer processes of POPs in soil and between the soil and the atmosphere, the uncertainties could be very large. (3) Comparison with Observations. The comparison with observations is very uncertain, it raised the questions about the conclusions reached in this paper about transport and residence time. We need some sorts of validations to our models. (4) Combined 6.3.2 and 6.3.3 since they are all regional climate.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 12569, 2005.