

Interactive comment on “Re-volatilisation of soil accumulated pollutants triggered by the summer monsoon in India” by Gerhard Lammel et al.

Anonymous Referee #2

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The authors discussed the re-volatilisation of the nowadays-banned POPs accumulated in soils. The abstract is too simple; there was not description on the data, the methods, and models used. The way of the method validation is also not very clear.

Specific Comments:

Line 18: Clean air masses from the Indian Ocean, advected with the onset of the summer monsoon, are found to trigger or enhance re-volatilisation of the nowadays banned chemicals hexachlorocyclohexane (HCH) and polychlorinated biphenyls (PCBs) from background soils in southern India.

Comments: Re-volatilisation of the chemicals in soil always exists at the boundary between soil and air, and cannot triggered by clean air masses from the Indian Ocean.

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Line 29: Semivolatile substances (i.e., vapour pressure at 293 K in the range 10⁻⁶ – 10⁻² Pa) tend to re-volatilise from land and seasurfaces to which they had previously been deposited, once a level of contamination in chemical equilibrium with air pollution is reached.

Comments: This statement is not correct since both the deposition and re-volatilisation co-exist regardless if the equilibrium is reached or not.

Line 56: Thus far, studies on environmental exposure of the Indian subcontinent have been mostly limited to urban areas (Chakraborty and Zhang, 2012; Sharma et al., 2014; Chakraborty et al., 2015), while the continental background was scarcely addressed.

Comments: The following three published papers should be addressed in the manuscript, since these three papers studied the SVOCs in Indian air and soil on a national scale.

Li, W. L., Ma, W. L., Zhang, Z. F., Liu, L. Y., Song, W. W., Jia, H. L., Ding, Y. S., Nakata, H., Minh, N. H., Sinha, R. K., Moon, H. B., Kannan, K., Sverko, E., Li, Y. F., 2017, Occurrence and Source Effect of Novel Brominated Flame Retardants (NBFRs) in Soils from Five Asian Countries and Their Relationship with PBDEs, *Environmental Science & Technology*, 51, 11126-11135

Li, Wenlong, Ma Wan-Li, Jia Hongliang, Hong Wenjun, Moon Hyo-Bang, Nakata Haruhiko, Minh Nguyen Hung, Sinha Ravindra Kumar, Chi Kai Hsien, Kannan Kurunthachalam, Sverko Ed, Li Yi-Fan, (2016). Polybrominated Diphenyl Ethers (PBDEs) In Surface Soils across Five Asian Countries: Levels, Spatial Distribution and Source Contribution. *Environmental Science & Technology*. 2016, 50 (23), 12779–12788

Hong, Wen-Jun, Hongliang Jia, Wan-Li Ma, Ravindra Kumar Sinha, Hyo-Bang Moon, Haruhiko Nakata, Nguyen Hung Minh, Kai Hsien Chi, Wen-Long Li, Kurunthachalam Kannan, Ed Sverko, and Yi-Fan Li, 2016, Distribution, fate, inhalation exposure and

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lung cancer risk of atmospheric polycyclic aromatic hydrocarbons in some Asian countries, *Environmental Science & Technology*. 2016, 50 (13), 7163–7174

Page 205: The differences in concentrations before and during monsoon are significant ($P < 0.05$, t-test) in south, central and parts of northern India (Fig. 3b,c).

Comments: In Fig. 3, there is no Panels b and c indicated!

Line 225: but soil concentrations only decreased for p,p'-DDT, while they have levelled off for α -HCH, or are even still on the rise (PCB153, Fig. S4).

Comments: There is no Fig. S4!

Line 260: Both, field measurements and modelling results reveal a thus far overlooked mechanism of pollutant cycling over the Indian subcontinent, i.e. monsoon-driven mobilisation from previously contaminated soils.

Comments: Rewrite the sentence.

Interactive comment on *Atmos. Chem. Phys. Discuss.*, <https://doi.org/10.5194/acp-2018-16>, 2018.

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