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## ***Interactive comment on “Transpacific transport of Benzo[a]pyrene emitted from Asia: importance of warm conveyor belt and interannual variations” by Y. Zhang et al.***

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The discussion paper by Y. Zhang et al. provides model results showing intercontinental transportation of BaP between East Asia and western US. The atmospheric lifetime of BaP is at most several days; BaP is currently believed to be consumed during intercontinental transportation. If this model results are correct, there will be a large impact in the field of atmospheric chemistry. In my opinion, this model should be more carefully validated by further comparisons with observation data:

The authors compare their model results with ambient BaP data observed several sites around the North Pacific. However, there are many other available ground-level PAH

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observation data in Asia-Pacific area (e.g., Simoneit et al., 2004; Sato et al., 2008 and references therein). These previous data showed PAH particles (emitted from East Asian countries) distributed to 140 degrees E, and detectable level PAH particles were not observed in the east of this longitude at a ground level. These previous data show a good agreement with Fig. 2b of this manuscript. I believe this kind of comparison provides a good check of the present model.

The concentration of BaP is often compared with the concentration of BeP, which is an isomer of BaP and has a longer atmospheric lifetime than BaP. If a substantial contribution of BaP from East Asia is observed at high altitude western US, a contribution of BeP from East Asia should be much higher than BaP. This indicates that a comparison of BeP model results with observed data provides better evidences of intercontinental transport of PAHs. Can the authors carry out such comparison?

Minor comment: Kanazawa is located at the main island of Japan. I think an island shown as Kanazawa in Fig. 1 is Amami Island.

References: Sato, K., Li, H., Tanaka, Y., Ogawa, S., Iwasaki, Y., Takami, A., and Hatakeyama, S.: Long-range transport of particulate polycyclic aromatic hydrocarbons at Cape Hedo remote island site in the East China Sea between 2005 and 2008. *J. Atmos. Chem.* 61, 243-257, 2008.

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