



Regional Dispersal of Fukushima-derived Fission Nuclides by East Asia Monsoon

Chih-An Huh (1), Chuan-Yao Lin (2), and Shih-Chieh Hsu (2)

(1) Institute of Earth Sciences, Academia Sinica, Taiwan, Province Of China (huh@earth.sinica.edu.tw), (2) Research Center for Environmental Changes, Academia Sinica, Taiwan, Province of China

Since the Fukushima nuclear accident happened on 12 March 2011, there have been a plethora of publications about the dispersion of radioactive material from the damaged reactors. Most of these works dealt with global transport of Fukushima-derived radionuclides in the northern hemisphere and local transport in the vicinity of Fukushima and around Japan. In contrast, few works investigated into dispersal of radiation plumes from Japan to other areas on regional scales. This is because regional dispersal out of Japan in the springtime is most likely dominated by the northeastern monsoon, whereas there are few monitoring stations downwind in the southeastern Asia region. In this respect, we are only aware of the data in Vietnam published by Long et al (2012) in addition to our own data obtained in and around Taiwan (Huh et al., 2012; Hsu et al., 2012). By integrating the data published in the literature plus those that can be searched from relevant websites, we try to further elucidate the dispersal of Fukushima-derived radiation toward the southeastern Asia region. The WRF/Chem tracer model is employed to simulate the dispersal of radiation plumes from the damaged Fukushima Daiichi Nuclear Power Plant. From a vis-à-vis comparison between the model simulation and the time-series of Fukushima-derived fission nuclides monitored around the southeastern Asia, we can distinguish between global transport by the Westerlies in the free troposphere and regional transport by the northeast monsoon in the planetary boundary layer. In general, regional (mainly meridional) transport carried more weight than global (mainly zonal) transport in contributing Fukushima-derived radioactivity to the area covered in this review, particularly at the ground-level sites.

References

1. Hsu, S.C., Huh, C.A., Chan, C.Y., Lin, S.H., Lin, F.J. and Liu, S.C. (2012). Hemispheric dispersion of radioactive plume laced with fission nuclides from the Fukushima nuclear event. *Geophys. Res. Lett.* 39, L00G22, doi:10.1029/2011GL049986.
2. Huh, C.A., Hsu, S. C. and Lin, C. Y. (2012). Fukushima-derived fission nuclides monitored around Taiwan: Free tropospheric versus boundary layer transport. *Earth Planet. Sci. Lett.* 319-320: 9-14.
3. Long, N.Q., Truong, Y., Hien, P.D., Binh, N.T., Sieu, L.N., Giap, T.V. and Phan, N.T. (2012). Atmospheric radionuclides from the Fukushima Dai-ichi nuclear reactor accident observed in Vietnam. *J. Environ. Radioactiv.* 111: 53-58.