EGU2020-19840, updated on 03 Jul 2022
https://doi.org/10.5194/egusphere-egu2020-19840
EGU General Assembly 2020

Re-assessment of airborne radiocesium re-suspended from contaminated ground surface after the Fukushima Nuclear Accident

Mizuo Kajino[1], Akira Watanabe[2], Yasuhito Igarashi[3], Yuji Zaizen[1], Takeshi Kinase[1], Masahide Ishizuka[4], and Kazuyuki Kita[5]

[1]Meteorological Research Institute, Tsukuba, Ibaraki, Japan (kajino@mri-jma.go.jp)
[2]Fukushima University, Fukushima, Fukushima, Japan
[3]Kyoto University, Kumatori, Osaka, Japan
[4]Kagawa University, Takamatsu, Kagawa, Japan
[5]Ibaraki University, Mito, Ibaraki, Japan

Kajino et al. (2016) (doi:10.5194/acp-16-13149-2016) assessed emission, transport, and deposition of airborne radiocesium from contaminated ground surface after the Fukushima nuclear accident for the entire year of 2013 by using numerical simulation, a field experiment on dust emission flux in a contaminated area (town of Namie, Fukushima prefecture), and air concentration measurements inside (Namie) and outside the contaminated area (Tsukuba, Ibaraki prefecture). In this study, additional comparison of the simulation results has been made against the fallout measurements made in Fukushima (city of Fukushima) and Tsukuba and we found that our previous simulation results substantial underestimated the observed fallout by 2 to 3 orders of magnitude. The reason is, in the previous simulation, we assumed the size distributions of aerosols are in the submicron range, even though recent studies indicated that the aerosol sizes should be much larger (i.g., Kinase et al., 2018, doi:10.1186/s40645-018-0171-z, Igarashi et al., 2019, doi:10.1038/s41598-018-37698-x, and this study). By assuming larger sizes of Cs-bearing aerosols, the simulated concentrations and depositions in both Fukushima and Tsukuba were significantly improved. Consequently, the re-assessed emission flux was modified by several ten times more than that previously assessed by Kajino et al. (2016), which was 0.048% per year.