Fluctuations of the Concentration of Cs-137 Aerosol in Chernobyl,Fukushima and Kawasaki

Yohei Ota, Yuko Hatano, Yukiko Okada, and Katsumi Hirose

University of Tsukuba, Graduate School of Systems and Information Engineering, Risk Engineering, Tsukuba, Ibaraki, Japan (i.t.f.551198@ezweb.ne.jp)

Statistical analysis is applied to a time series of the airborne concentration of Cs-137. In order to extract fractal characteristics of the fluctuations, we employed the Hurst analysis. Interestingly, the Hurst index is around 1/3, which is common to the Chernobyl data, Fukushima data, and Kawasaki data. The Kawasaki data is measured by the Tokyo City University, located at 40km south to Tokyo. We proposed a stochastic differential equation, based on an advection equation with winds fluctuating probabilistically. The averaged solution of the equation is compared with measured data. We found that the index of the power of the time is -4/3, which is common to the three cases, Chernobyl, Fukushima and Kawasaki.