



## **An accurate derivation of the air dose-rate and the deposition concentration distribution by aerial monitoring in a low level contaminated area**

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Since 2011, MEXT (Ministry of Education, Culture, Sports, Science and Technology, Japan) have been conducting aerial monitoring to investigate the distribution of radioactive cesium dispersed into the atmosphere after the accident at the Fukushima Dai-ichi Nuclear Power Plant (FDNPP), Tokyo Electric Power Company. Distribution maps of the air dose-rate at 1 m above the ground and the radioactive cesium deposition concentration on the ground are prepared using spectrum obtained by aerial monitoring. The radioactive cesium deposition is derived from its dose rate, which is calculated by excluding the dose rate of the background radiation due to natural radionuclides from the air dose-rate at 1 m above the ground. The first step of the current method of calculating the dose rate due to natural radionuclides is calculate the ratio of the total count rate of areas where no radioactive cesium is detected and the count rate of regions with energy levels of 1,400 keV or higher (BG-Index). Next, calculate the air dose rate of radioactive cesium by multiplying the BG-Index and the integrated count rate of 1,400 keV or higher for the area where the radioactive cesium is distributed. In high dose-rate areas, however, the count rate of the 1,365-keV peak of Cs-134, though small, is included in the integrated count rate of 1,400 keV or higher, which could cause an overestimation of the air dose rate of natural radionuclides.

We developed a method for accurately evaluating the distribution maps of natural air dose-rate by excluding the effect of radioactive cesium, even in contaminated areas, and obtained the accurate air dose-rate map attributed the radioactive cesium deposition on the ground. Furthermore, the natural dose-rate distribution throughout Japan has been obtained by this method.