

Original

## Simulation of Predicted Effects of Decontamination and Cultivation Activities on Reduction of Air Dose Rates using Monte Carlo method

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• **Summary** • More than 10 years have passed since the accident at TEPCO's Fukushima Daiichi Nuclear Power Station. To facilitate the return of residents, specified reconstruction and revitalization base areas have been established in areas that are difficult to return to, and intensive infrastructure development and decontamination have been carried out. Against this background, the objective of this study was to quantitatively evaluate the effect of decontamination and agricultural work on reducing ambient dose rates. Using 3D-ADRES, which enables the construction of detailed environmental models, we constructed a model that reproduces in detail the distribution of structures and radiation sources in the environment for a real area located in Okuma town, Fukushima Prefecture. In addition, we used PHITS to perform a Monte Carlo simulation of radiation and estimated the detailed distribution of radiation doses. The model reflects the realistic distribution of radioactive Cs based on observations and takes into account changes over time. As a result, the model calculated the distribution of air dose rates at 100 cm above the ground in the target area and reproduced the measured values well. It was also confirmed that the effects of decontamination and cultivation activities can be evaluated simply and in detail. From the above, it can be concluded that 3D-ADRES is an extremely effective system for evaluating dose rate reduction measures such as decontamination in difficult-to-return areas where entry is still restricted.

**Key Words:** radiocesium, air dose rate, detailed environmental model, Monte Carlo method, decontamination

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