

Seasonal deposition of radiocesium in wooden houses from summer to winter seven years after the Fukushima nuclear accident

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As the evacuation zone covering around the Fukushima nuclear plant will be re-opened, some of residents would return to their houses. Nevertheless reports on the contamination in their houses are limited [1], especially the information of short-time scale contamination is completely insufficient. Due to the diversity of residents' lifestyles, to provide information of deposition interior the house is very important from the perspective of radiation protection prior to cancellation of the evacuation order.

In this study, seasonal deposition of radiocesium contamination interior the wooden houses in the evacuation zone, Fukushima, Japan, has been investigated from Sep. 2018 to Feb. 2019.

Because electric power has been interrupted since the Fukushima accident in 2011, dust sampler could not use for sampling over research period. Thus, a method of collecting radiocesium using cloths was applied. Although this method is capable of long-term sampling, it is not as efficient as the method using basin. Therefore, the results of this research may be underestimated than the actual deposition.

Two representative results are shown below:

[A case in Okuma town] The house to be surveyed is located about 5 km from the Fukushima nuclear plant and was a wooden house built in 2007. In this house, deposition has been confirmed to range from 3.2×10^{-4} to 4.1×10^{-5} Bq·cm⁻²·day⁻¹ from summer to winter season, 2018 and it was found that this range was one order of magnitude less than the outside deposition of the same period. During the survey period, there was a positive correlation between the number of days with no precipitation and the amount of deposition.

[A case in Namie town] One of the houses in Namie Town is located about 11 km away from the Fukushima nuclear plant and was a typical Japanese-style house. From the end of August to the beginning of September, deposition was higher than that in other seasons, which was 4.0×10^{-4} Bq·cm⁻²·day⁻¹. This may be caused by frequent entry of residents for the care of the house.

[1] N. Shinohara and H. Yoshida-Ohuchi, Radiocesium contamination in house dust within evacuation areas close to the Fukushima Daiichi nuclear power plant, Environment international, 114, 107-114, 2018.

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