

Development of dosimeter with positioning system

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As for the mobility of anthropogenic radiocesium such as ¹³⁴Cs and ¹³⁷Cs released by Fukushima disaster (2011) in the environment, it has been well reported (e.g., study zone, year) by using vehicles and aircrafts. However, assuming the refugees return to their home in the future, it is of importance to grasp the distribution of the dose rate with much higher space resolution than that of the conventional survey. Thus, improvement of the dosimeter with positioning system is critical subject in Japan.

We developed a compact dosimeter that can acquire positioning information with high accuracy. Our logging system consists of a dosimeter and a GLONASS satellites system, which has a characteristic function to write location (lat-logi) and dose rate ($\mu\text{Sv/h}$) on a SD card simultaneously, results can be described directly on Google Earth. Since the location system uses the quasi-zenith satellites in addition to GLONASS satellites network, the location can be determined with high accuracy. Space resolution is depending on the moving speed, small contaminated spots around the house can be detected without stopping. In addition to the dosimeter that is standardized in Japan, the location system can be attached to several kinds of dosimeter. Thus, it became possible to visualize the high and low of the dose rate caused by the movement of deposited radiocesium.

We have been measured the dose rate in evacuation zone and control, and succeeded in visual observation of the radiocesium mobility. By using 2' NaI scintillation counter with the GLONASS unit, we could detect a contaminated spot (highest point: 340 $\mu\text{Sv/h}$, spot size: $\phi 30$ cm) on the roadside around the Fukushima plant in 2014 (Figure).

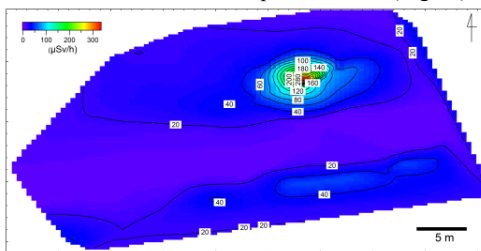


Figure: Visualization of a contaminated spot (~ 340 $\mu\text{Sv/h}$) around the Fukushima plant.