

§2. Environmental Radiation Monitoring at Toki Area

Uda, T., Tanahashi, S., Sakuma, Y., Yamanishi, H., Kawano, T., Miyake, H., Hirabayashi, H., Obayashi, H.

Yoshida, I., Nishiyama, K., Takenaka, K., Furuta, K., Kaede, M., Watanabe, K., Goto, J., Morikawa, A., Sugiyama, N., Sugiura, M., Nakano, K. (Plasma Research Committee of Toki-city), Maruyama, H. (Nishiwara Junior High School), Endo, M. (Tajimi Technical High School), Takagi, M. (Tajimikita High School), Kano, J. (Tajiminishi High School)

Environmental radiation monitoring activity has been continued to define radiological distribution and behavior with time elapse under natural conditions. To clarify the regional radiological characteristics means to studies environmental dynamics at the view points of geological effects to the local area according to operation of LHD and another radiation generation devices. This study started as collaboration with Plasma Research Committee of Toki-city. It is significant to collaborate with teachers of public schools around Toki area and NIFS. Radiation monitoring methods and results are as follows.

TLD (thermo luminescence dosimeter) pellets ($\text{CaSO}_4 \cdot \text{Tm}$, UD-200S made by Matsushita Elec. Co.) were set at 16 points at Toki and Tajimi area for 3 months (exchanged in June, September, December and March). The environmental radiation exposure rates are distributing in 50-150 mR/y, almost equal to 0.5-1.5 mSv/y. There is not a noticeable fluctuation at the same point. Except for the periodical monitoring, we measured environmental radiation going along the ancient highway Nakasendo using compact radiation monitors named Hakarukun DX200. It

was confirmed that natural radiation intensity distributes between 25 nSv/h and 100 nSv/h, and it depends on geological factors. For example at the outcrop of granite layer, measured intensity is high. To the other hand it shows low intensity on the gravel.

Recently measurement of radon and its daughters in the environment have been started. Radon and its daughter nuclides are considered as representative radiation source for public exposure from natural radiation especially in-door residents. The radon concentration was measured with a nuclear track detector of CR-39 plastic. About 1 cm square CR-39 plate was set in a hemispherical aluminum cup. Air in the cup may be ventilated naturally one time per 5 hours. Alpha particles emitted from radon nucleids inject into the CR-39 plate. After 3 months the plastic plates were removed, and etched in 7.5 N NaOH solution at 80 °C. Then the track number is counted by a micro-scope. The radon concentrations observed are around 10 Bq/m³ beside the point of Kawai where it shows about 45 Bq/m³. Relationships between TLD measured values and radon concentrations are shown in Fig. 1. The maximum concentration is observed at the point of largest radiation intensity measured with TLD. But sample number is too small to find a general tendency. This radon monitoring should be further continued.

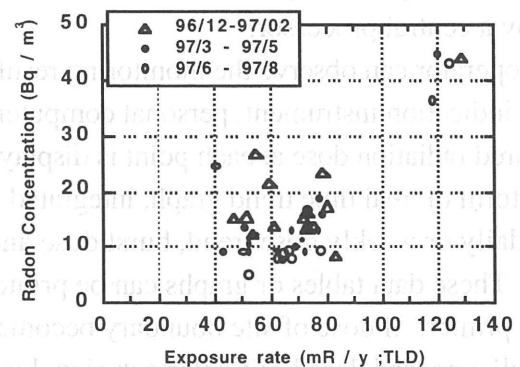


Fig.1. Relation of environmental radiation measured by TLD with radon concentration.