

§3. Environmental Radiation Monitoring at Toki Area

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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 study environmental dynamics at the view points of geological effects to the local area according to operation of LHD and another X-ray generating devices in the Toki site of NIFS. This study started as collaboration with Plasma Research Committee of Toki-city. It is significant to collaborate with teachers of public schools in and around Toki city from view point of education and public acceptance for NIFS research activities. In the present report, results of environmental radiation monitoring and some activities of the committee are mentioned. Environmental radiation monitoring methods and results are as follows.

TLD (thermo-luminescence dosimeter) pellets (CaSO₄.Tm, UD-200S made by Matsushita Electric Co.) were set at 16 points at Toki and Tajimi area in 3 months, strictly speaking that they are exchanged on the first Saturday of 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 of the dose level at the same point. Major dose level seems to depend on the geological condition, for example high dose level is observed at the granite layer cropped out place. TLD is possible to measure external radiation exposure dose rate, to the other hand Radon monitor is possible to estimate radiation source relating to internal exposure dose.

As natural radiation source radon and its daughter nuclides have been monitored. Radon and its daughters are

considered as representative natural radiation source for public exposure especially in-door residents. The radon concentration was measured with a nuclear track detector of CR-39 plastic plate. The radon concentrations observed are around 10-20 Bq/m³ beside the point of Kawai where it shows about 30-60 Bq/m³. The other high concentration place is Nakazawa where is 10-45 Bq/m³ and concentration measured in a few years is unstable. This radon monitoring should be further continued.

As a special event in summer, we visited to Nobeyama Radio Observatory of National Astronomical Observatory. We learned about genesis of the structure of the universe, and formation and evolution of galaxies and planetary systems. It may be helpful to understand environmental radiation field related to cosmic rays.

Except the environmental radiation monitoring activities, and study about fundamental characteristics of radiation, many radiation problems are concerned in this committee meeting. Results of the committee activities are summarized as follows.

- (1) Basic consideration about geological science was lectured by Prof. Y. Yusa (Tono Geoscience Center).
- (2) Fundamental problems about relation of underground water or hot springs water and Radon concentration was studied. This theme may be very interesting and familiar subject to public. So these subjects should be sufficiently informed.
- (3) Study about criticality accident at Tokai-mura. Such a severe accident must not be happened. But to know the fact is very important for considering nuclear power energy developments.
- (4) Basic consideration about biological effect of low level radiation exposure to human was lectured by Prof. S. Kondo (Osaka Univ. and Kinki Univ.) He emphasized that importance is to understand the radiation correctly, and we should not fear with incorrect understanding. This lecture was very clear and helpful to understand about hazard of radiation.
- (5) Many co-researchers reported example of practically performed education in school and discussed about the responses.

These activities of the Toki Plasma research Committee may be significant to apply for the science education in primary school, junior high school and high school.