

Fundamental measurements of Radon concentration in a cave and the atmosphere for earthquake prediction II

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An increase of the radon in underground water at Nishinomiya City¹ and an increase of the radon in atmosphere² at the southern part of Hyogo Prefecture earthquake in 1995 were reported. Moreover, in the case of Tohoku Region Pacific Coast Earthquake, the data of the exhaust air monitor in the radiation facility of Fukushima Medical College (Fukushima) has been reported that the peak duration was long, and the peak decreased rapidly before the earthquake³.

We had started to measure radon concentration in a pit of Kurashiki mine, Okayama from the beginning of November, 2009, and started to measure radon concentration in the atmosphere from the end of May, 2011 at Chiba Institute of Science in Choshi, Chiba. We used a Radon Monitor of SUN NUCLEAR Corporation, Model 1028 in the Kurashiki, and a Pylon Trace Environmental Level Radon Gas Detector in Choshi.

In relation to the Southern Hyogo Prefecture Earthquake, seasonal variation in the radon concentration of the air was removed by using the exponential smoothing method^{4, 5}. This time we also try to analyze radon concentration variations at the above 2 area using the exponential smoothing method.

In the variation of radon concentration in the pit of the Kurashiki mine, there were twice cases which were over 3 residual error. The 1st case was that earthquake of magnitude 3.3 had happened at eastern Shimane after three weeks. The 2nd case was that no earthquake had happened for four weeks. Then we could not get clear correlation between increase of residual error and the earthquake.

The exponential smoothing method was applied to variation of radon concentration, although the observation period at the Chiba Institute of Science has not passed for two years. However, we could get no date which exceeded 3 residual error. In earthquakes at Choshi, Chiba, their epicenters were almost in the sea.

Since the data of Kobe Pharmaceutical University and Fukushima Medical University are a prolonged measurement over ten years, it is necessary to continue radon concentration observation for a long period at Kurashiki and Choshi.

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