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Radioactivity measurement for air-dust and soil collected in eastern Japan area after the nuclear accident at the Fukushima Daiichi Nuclear Power Station

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On March 12, 2011, a large amount of radioactive nuclides have been released into the environment by the nuclear accident at the Fukushima Daiichi Nuclear Power Station.

Our group started radioactivity measurements for I-131, Cs-134, Cs-137 and the other radio nuclides from air dust collected using high-volume air sampler by germanium semiconductor detector soon after the accident. Air dust samples have been collected at some spots in eastern Japan periodically. In some cases, we have used charcoal filter to collect I-131 in the form of gas, and collections of air dust by cascade impactor were also performed to separate air dust according to molecular mass. We have already measured more than 500 air dust samples, and we will discuss the distribution and time variation of radionuclides in the environment.

In addition to gamma-ray measurement targeting I-131, Cs-134 and Cs-137, our group has been carrying out detection of pure beta emitter like Sr-89 and Sr-90 in soil and filter using chemical separation technique. Because Sr-89 is a short life radionuclide ($t_{1/2} = 50.5$ d), the existence of Sr-89 represents the radionuclide is originated from the accident. For this purpose, we developed strontium isolation technique using solid-phase extraction method and selective detection technique of radioactivity of Sr-89 and Sr-90 using Cerenkov counting.

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