

Development of the airborne gamma ray measurements by the plastic scintillator detector using an UAV helicopter

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The detector of the airborne gamma ray measurements which flies an airplane and a helicopter uses a NaI (Tl) crystal. Measurement efficiency of NaI is high and can measure it in normal temperature. However, NaI can detect only a gamma ray. Moreover, form is restricted to the pillar or the cube and weight of NaI is heavy. There is a fault, such as NaI being shockingly weak and expensive.

On the other hand, the radioactivity detector plastic scintillator (PS) can measure a neutron (n) and a gamma ray. Moreover, measurement of PS is possible in normal temperature, and it can change form free. Furthermore, the feature of PS is cheap and lightweight. However, PS has the fault that it cannot discriminate from the energy of a gamma ray simply, and there is no example used as apparatus for airborne gamma ray measurements until now.

For this reason, if discrimination of gamma ray energy is attained by PS, we will become possible using the function which was excellent in PS by airborne gamma ray measurements. And it is possible for us to develop the measuring device that measurement accuracy is high, lightly (the weight of exploration equipment). We developed the simple energy discriminating method of PS. And using the function which was excellent in PS, the gamma ray and the neutron could be measured simultaneously and research and development in small lightweight PS detector measurement system which can be carried in an Unmanned Aerial Vehicle(UAV) helicopter.

Airborne gamma ray measurements is used for geological surveys, such as a surface geological survey, fractured zone investigation, and a survey of natural resources.

Moreover, it is periodically carried out in the environmental radiation investigation around a nuclear facility overseas.

By this research and development, we can utilize for the radioactive exploration of a geological survey at a low price easily, and also become the environmental radiation investigation around a nuclear facility utilizable. Although the flight of the airplane is especially restricted by the Aviation Act in the nuclear facility, the radiation measurement around a nuclear facility of us becomes possible by using an UAV helicopter. Moreover, since a neutron can also be measured simultaneously, it can respond also to the radiation survey in the emergency around a nuclear facility.