

Development of a Tool to Facilitate the Understanding of Radiation Applying Analogy between Radiation and Light

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Summary

Invisibility of radiation might hamper people's understanding on radiation. To overcome this invisibility a new tool, which could visualize the characteristics of radiation and the effects of decontamination by replacing invisible radiation to visible light based on the physical analogy between radiation and light, has been developed. Light emitting diode (LED) is adopted as light source in lieu of radionuclide. Illuminometer is used instead of dosimeter as detector to enable the quantitative measurement of illumination intensity. All these functions are equipped in a compact case made of acrylic resin plates. Contamination condition could be represented by turning on LED lights and decontamination condition could be represented by turning off LED light. Both spot and areal contamination conditions could be simulated by changing the shape and arrangement of LED lights. Inside space of the case is partitioned to two sub-spaces with an acrylic plate which simulates the outer wall of building. One sub-space stands for indoor space and the other outdoor space. This tool using light could facilitate the intuitive understanding as follows; (1) physical characteristics of radiation such as attenuation by distance and shielding by substance, (2) concept of decontamination and its effects, and (3) exposure dose concept. Besides this tool has been developed another tool which could demonstrate the wide range of radiation doses in a shape of intensity of light by the combination of LED lights and shading filters.

These tools are very effective and fascinating teaching material or risk communication device for supporting the intuitive understanding of radiation and decontamination by people.

Key Words: Analogy between radiation and light, Radiation education tool, Risk communication tool,
Radiation and decontamination
