Invited Talk 5

Radon measurements indoors, in soil and in water by track detectors and/or by Geiger-Muller counters

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The large radon concentrations of the home's indoor air can be caused essentially by two sources, the soil or the water supply. A thoroughly investigation of the indoor radon may require the measurement of radon indoors, in soil, and in water respectively. With existing technologies, these radon measurements require a variety of different devices and sampling procedures. Finally, a new generation of passive radon monitors has been developed, which makes it possible to obtain a multitude of different types of measurements indoors, in water, and in soil with a single compact device. This device can be referred to as a radon film-badge, which is formed by a radon-sorption plastic-film facing an alpha-particle detector. This radon film badge, once enclosed in a radon permeation-bag, makes it finally possible to use the same device for Rn-measurements indoors, in soil, and in water for different exposure durations from a few days to one year.

The radon film badge is based on the detection of tracks induced by alpha particles from a radiator-absorbed radon and its decay-products. Finally, it has been proved that it is possible to measure the radon without using the track detector. In this case, the radiations emitted from the radon (and its decays) from the radiator are counted directly by a Geiger-Muller counter.

In order to prove the unique characteristics of these two novel radon monitoring techniques, they are used for the measurement of very different radon concentrations, which may vary from a few tens of B_Q/m^3 for indoor radon to the extremely large radon concentrations, encountered in water wells and/or in the thermal waters of a SPA. These radon concentrations can be larger than 10000 KB_Q/m^3, as those encountered in the Lurisia SPA from Italy, the thermal waters of which were first studied for their large radioactivity by Madame Curie (Ciardi, 2017).

Reference : M. Ciardi. Marie Curie-La signora dei mondi invisibili. Hoepli Ed., Milano (2017)