



Contribution ID: 264

Type: Verbal

Radon measurements: a way to disseminate scientific culture among young students in Italy

Tuesday, 20 April 2010 08:30 (20 minutes)

Usually, the lack of information cause to be afraid about what we don't know, imputing to it a greater hazard. On the contrary we face up without fear activities that have a high level of riskiness, but for which we have direct experience. In other words the subjective perception of the risk very often doesn't correspond to the objective and real risk of an activity. In particular the radioactivity theme is misled because it is almost unknown and the public links this concept to nuclear arms and to its usage in uncorrected way to produce energy in the nuclear power plants, even if in the last 50 years NPP for civil uses has significantly fewer casualties than any other source of energy. However, because public opinion is driven by emotions rather than rational knowledge based views nuclear power's association with nuclear weapons has contributed to its lack of acceptance in many places throughout the world and in particular in Italy the "nuclear issue" has been for a long time a taboo. A way to make the public more trusting to nuclear issue, that the people can have a more rational reactions and could build up a personal understanding about these issues, is to discuss about this theme and about radioactivity and ionizing radiation, starting from young students.

On these bases several Physics Departments with Lauree Scientifiche Project and sections of the National Institute of Nuclear Physics (INFN) with ENVIRAD-SPLASH Project would give to the students of secondary school and to their teachers the opportunity to face these themes with basic information and with an experimental activity.

The approach is to have students engaged in activities that will allow them to understand how natural radioactivity is a part of our everyday environment. This would include how radiation enters our lives in different ways, to demonstrate that natural radioactive sources found in soil, water, and air contribute to our exposure to natural ionizing radiation and how this exposure effects human health.

Depending on local situations and the specific experiences of the students, several approaches were used. However, collaboration among the schools was an essential element in the program's success. The core idea is that: a) to provide the students a furnished laboratory at their school so that they can measure the natural component of the radioactivity that surround us. In this exercise the measurement of the Rn-222 concentration is particularly well suited b) to show the different types of radiations including ionizing radiations and how they each relate to the other; c) to demonstrate how easily ionizing radiations can be measured; d) and to prove the fun a student can derive from discovery and detection of ionizing radiation in the environment. In this paper the experience of Milano reality is been reported in more detail.

Another objective is to develop a new technique for teaching physics which will enhance scientific interest of students in applications of nuclear physics in both environmental and physical sciences.

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Session Classification: Nuclear Analytical Methods 4

Track Classification: Education