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#09-140 Microradon project

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Radon is the most important radioactive noble gas existing in nature. It belongs to the radioactive decay chains of ^{238}U and ^{232}Th . As an inert gas, radon, and in particular the long-lived isotope, ^{222}Rn ($T_{1/2} = 3.82$ day), has high mobility and can easily escape from materials containing traces of Uranium. For low energy and low counting rate experiment in particle and astroparticle physics (some neutrino experiments or direct dark matter research), the diffusion of radon, from the detector components, to active part of the experimental setup is very often the origin of the most important background. A radon concentration below a few tens of atoms of $^{222}\text{Rn}/\text{m}^3$ is often a prerequisite for future experiments.

In this context, the MICRORADON project between three IN2P3 laboratories (CPPM-Marseille, CENBG-Bordeaux and IPHC-Strasbourg) has recently been launched. The aim of this project is to study the physics of radon (emanation, transport and capture) in extreme conditions (low temperature, high pressure, liquid gases, etc.) in connection with the requirements of future very low background experiments. Special attention is paid to the development of radon detectors in accordance with these conditions (low background, high sensitivity, high specificity...)

After the exposure of the basic mechanisms leading to the presence of radon in an experiment, we will present the main results obtained in the MICRORADON project and the perspectives for the future.

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