222Rn as tracer for climate studies: from the enlargement of the atmospheric network to the scientific applications

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The natural radioactive gas radon (Rn-222) is being extensively used as tracer for studying a variety of atmospheric processes, such as boundary layer characteristics, the exchange of greenhouse gases between the surface and the lower troposphere and the improvement of atmopsheric transport models. The rule of radon gas as tracer for greenhouses gas studies leads to the need of monitoring its atmospheric concentrations with high spatial density and to produce reliable radon flux inventories to be used in inverse modelling validations. The International and National GHGs monitoring infrastructures are already including atmospheric Rn-222 monitors in their stations as recommended gas. Nevertheless, there is still a huge lack of data in southern Europe and, more generally, over the Mediterranean region. In addition, a harmonization of the experimental techniques applied for the measurements of atmospheric Rn-222 concentrations and Rn-222 fluxes is needed.

In this state of the research, the Radon Laboratory (LER) of the Institut de Tècniques Energètiques (INTE) of the Universitat Politècnica de Catalunya (UPC) is working, in collaboration with many national and international scientific groups, at : i) the improvement of techniques for the measurement of atmospheric Rn-222 concentrations; ii) the enlargement of the atmospheric Rn-222 measurements in Spain and their harmonization in Europe; iii) the standardization of the Radon Tracer Method (RTM) for the retrieval of GHGs fluxes in rural and urban areas.