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NORM at indoor environments using aerosols passively collected at classrooms of Lisbon basic schools

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This work aims to develop methodologies to characterize the composition of the total particulate matter (TPM), collected inside classrooms of three basic schools, in Lisbon, Portugal. The selection of the schools was based on different proximity to city centre: one at downtown, other at the city border and the other at middle distance between both. Quartz and polycarbonate filters are being used. Each filter has a 47 mm diameter and was exposed inside plastic Petri slides. TPM masses are being collected passively during 2009/2010. Although the filters are being exposed inside a small area, significant differences between the masses are observed. Exposed filters and blanks are being measured during a 3 days period in a gamma-X hyperpure germanium detector aiming the detection of natural radionuclides.
The following natural radionuclides could be found: 1) 210Pb, 214Pb, 214Bi, 226Ra, 234Th with origin in 238U, 2) 212Pb and 228Ac originated from 232Th, 3) 208Tl originated from 237Np, 4) 40K originated from 39K. Millipore polycarbonate filters were quite adequate for all measurements except for 210Pb, 226Ra and 234Th, for which quartz filters were found to be more suitable. Results are compared with literature ones and discussed under the point of view of their origin. Methodologies are developed in order to get accurate efficiency calculations for the 47 mm diametr filters.

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