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Radon spatial and seasonal variations in University's buildings located in an Italian karst region

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In the framework of a collaboration between INAIL and University of Salento (UniSalento in the following) a radon survey in 54 buildings belonging to the UniSalento's campus was performed. The buildings are located mostly in a restricted area presenting a morphology characterized principally by marls, calcareous marls and calcarenites belonging to several Pleistocene sedimentary cycles (karst area).

The survey was performed monitoring for two consecutive semesters corresponding to spring/summer (SS) and autumn/winter (AW) about 900 rooms located at different floors (see tab. 1). Moreover, in a restricted sample of about 250 rooms another radon monitoring was performed for six-months corresponding to winter-spring season (WS) in order to better characterize radon seasonal variations and to evaluate if the indoor radon concentration in a certain season could be assumed as representative of a one year radon level. For radon monitoring, passive devices with SSNTD were used; more information about laboratory technique and procedures are given elsewhere (1–3).

The analysis of radon level distribution respect to floors highlighted not negligible radon levels also in rooms located at upper floors, in particular in historical buildings (figure 1). This situation requires particular attention in choosing and testing the proper remedial actions. The estimated annual Radon concentration are very similar to the ones calculated for the WS period ($\text{annual_Rn} / \text{WS_Rn} = 1.1$). Regarding the ratio between SS and AW an inverted seasonal factor was found out: $\text{AW/SS} = 0.85$. This phenomenon was also found in other karst areas (4), although generally it is not common to find higher radon concentration during SS than in AW.

References

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