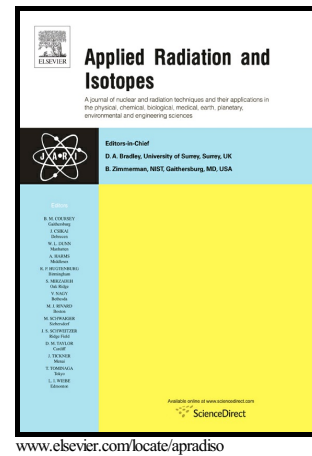


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## Seasonal variation of indoor radon concentration in a desert climate

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### *Abstract*

Radon is one of the sources that negatively affect dwellings air quality and is ranked as a main cause of lung cancer after cigarette smoking. The indoor radon concentrations usually affected by the conditions of the environment surrounding the dwellings. Seasonal variations can have a significant impact on the indoor radon concentrations. In this article, we studied the seasonal variations of indoor radon concentration in a desert climate, particularly in gulf countries that usually leave the windows and doors closed all over the time. Four hundred dosimeters containing CR-39 detectors were planted for three months to measure the variation in radon concentration between winter and summer seasons. Our measurements showed that a building with a basement revealed a significant variation between radon concentration in winter ( $44.3 \pm 3.1$  Bq m<sup>-3</sup>) and in summer ( $26.1 \pm 1.7$  Bq m<sup>-3</sup>). Buildings without basements showed that the indoor radon concentration in winter ( $16.1 \pm 1.7$  Bq m<sup>-3</sup>) is very much close to that in summer ( $16.7 \pm 1.8$  Bq m<sup>-3</sup>). Our results indicated that seasonal variations can significantly affect indoor radon concentration for buildings established with basements. However; in the study region, the average indoor radon concentration as well as the annual effective dose rate are found to be below the action level recommended by ICRP.

**Keywords:** Radon concentration; Desert climate; Seasonal radon variation; Effective dose rate.

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