



## **Variation of radon concentration levels in the Tusham Ring Complex: influence of trace elements, exhalation rate, gamma levels and regional geology**

B S Bajwa (1), H Singh (1), J Singh (1), S Singh (1), N Kochhar (2), and R Sonikawade (3)

(1) Department of Physics, Guru Nanak Dev University, Amritsar-143 005, India (bsbajwa2k2@yahoo.co.in / 0091 183 2258820), (2) Department of Geology, Punjab University, Chandigarh, (3) Health Physics Division, IUAC, New Delhi

In the present study, an attempt has been made to study the influence of exhalation rate, trace element concentration, gamma levels & regional geology on the variation of indoor radon concentration levels in the dwellings around the Tusham Ring Complex, Bhiwani, Haryana, a region famous for acid volcanic & the associated high heat producing (HHP) granitic rock formations. The indoor radon measurements have been carried out in dwellings using the passive technique employing Solid State Nuclear Track Detector (LR-115 type 2). The indoor radon levels in these dwellings have been found to be varying from  $109 \pm 10$  to  $1006 \pm 107$  Bqm<sup>-3</sup> whereas these vary from  $60 \pm 17$  to  $235 \pm 55$  Bqm<sup>-3</sup> for the dwellings studied in Amritsar District, Punjab. The indoor radon concentration levels only at some places, which are close to the exposed HHP granite rock formations, have been found to be higher.

The study of the exhalation rate measurements of the rock/soil samples have also been carried out by the passive technique using the LR-115 films and slightly higher exhalation rates have been observed from samples collected from HHP granitic rock formation regions of the Tusham ring complex, as compared to other adjoining regions. It has also been observed that especially in dwellings situated on or around the exposed HHP granitic formations, where the indoor radon concentrations are higher, the gamma activities are also high. Particularly for these places, a good correlation ( $R^2=0.64$ ) has been observed between indoor radon and gamma activity, indicating that along with the surface-soil, the exposed HHP granitic rocks belonging to the Malani igneous suite are actively contributing towards higher activities observed at certain places. Typical activity concentrations for radium and thorium content in the rock specimens of this region carried out by the Gamma Spectrometry varies from 115.4 - 694.8 Bqkg<sup>-1</sup> and 109.5 - 1463.7 Bqkg<sup>-1</sup> respectively. The results of the indoor Rn/Th variations in dwellings obtained by the active-technique using RAD-7, will also be discussed.