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A Follow up Study on Indoor 222Rn, 220Rn and Their Decay Product Concentrations in a Mineralized Zone of Himachal Pradesh, India

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Abstract : A follow up study was taken up in a mineralized zone situated in Hamirpur district, Himachal Pradesh, India to investigate high values of radon concentration reported in past studies as well to update the old radon data based on bare SSNTD technique. In the present investigation, indoor radon, thoron and their decay products concentrations have been measured using the newly developed Radon-Thoron discriminating diffusion chamber with single entry face, direct radon and thoron progeny sensors (DRPS/DTPS) respectively. The measurements have been carried out in seventy five dwellings of fourteen different villages. Houses were selected taking into consideration of the past data as well as the type of houses such as mud, concrete, brick etc. It was observed that high values of earlier reported radon concentrations were mainly because of thoron interference in the Solid State Nuclear Track Detector (LR-115 type II) exposed in bare mode. Now, the average concentration values and the estimated annual inhalation dose in these villages have been found to be within the reference level as recommended by the ICRP. The annual average indoor radon and thoron concentrations observed in these dwellings have been found to vary from 44±12-157±73 Bq m-3 and 44±11-240±125 Bq m-3 respectively. The equilibrium equivalent concentrations of radon and thoron decay products have been observed to be in the range of 10-63 Bq m-3 and 1-5 Bq m-3 respectively.

Keywords : radon, thoron, progeny concentration, dosimeter
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