

## A new method for measuring tracks density in CR-39 detectors by compensating for overlapping tracks

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**Abstract:** CR-39 nuclear track detectors have been used as an efficient radon monitoring system. Exposing these detectors to radon would result in tracks where ever particles hit the surface of the detector. Natural radioactivity of alpha particles (radon concentration) is measured based on the count of these tracks on CR-39 detector. Counting these tracks by eye is not an easy task especially when the density of the tracks is high. Automated tracks counting systems are attractive solution for this problem. However, as the density of tracks increases the accuracy of these methods deteriorates. This is due to the fact that overlapped tracks are counted as one track during the segmentation process resulting in an underestimation of the real count of the tracks. This work proposes a new image processing based automated approach for tracks counting. This new automated approach solves the problem of counting overlapping tracks by approximating their number and then adjusting the final count of tracks by compensating for those uncounted tracks. The experimental results show that the proposed approach reduces the counting percentage error from 5.64% to 2.54% by solving the counting problem of the overlapped tracks.