

COMPARING TRACK SHAPE ANALYSIS-BASED AUTOMATED SLIDE SCANNER SYSTEM WITH TRADITIONAL METHODS

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CR-39 nuclear track detectors are routinely used for the passive measurement of radon and neutron exposure. In the last years the measurements with CR-39 detectors with the development of different image processing methods have played an increasing role, more and more companies have developed new methods for the processing and counting of the tracks.

This study describes the evaluation method based on high-resolution slide scanner, and its quality check.

A high-resolution (4800x4800 dpi) scanner was used for the development and CR-39 detectors exposed were processed using several types of software commercially available.

Evaluations were performed in transmission and reflective modes, and the images obtained were evaluated using image analyser software both with and without shape recognition.

In order to reduce detection limits and to improve the method's reliability several ways of reducing limits were inspected.

The quality control of the method providing the best results was performed and the method was validated, during which the measurement reproducibility, the measurement total uncertainty and the measurement exactness related to reference detectors were identified. With the traditional (visual) comparative analysis of the 563 detectors it was found that this method was appropriate for precision and reliable analysis of tracks, and other pseudo-tracks (scratches, contamination) do not perturb measurement accuracy due to track shape analysis. A great advantage of this method is that no scanner with a specially modified sample holder is required.

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