

INTERCOMPARISON OF CALIBRATED CR-39 TRACK THORON PROGENY DETECTORS BY ACTIVE THORON DEVICES UNDER ON-SITE CIRCUMSTANCES

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Introduction

Nowadays, beside radon (^{222}Rn) and thoron (^{220}Rn) more and more attention is given to identifying their progenies. They stick to solid particles contained in the air and depending on their size they may deposit in different parts of the lungs. The track detectors (CR-39) are the most wide-spread detectors in different surveys. At our institute the calibration of a Japanese developed thoron progeny measuring track detector has been implemented. During the measurements the parameters (temperature, atmospheric pressure, humidity) have been almost (1-2%) constant. Pylon WLx monitor was used and the measurement results of this instrument were compared with the results provided by the track detectors. During the comparison it was found that the concentration values showed great correspondence.

Materials and methods



Calibration chamber



Pylon WLx



^{220}Rn progeny track detector



Slide-scanner evaluation system

The evaluation system is made up:

- High resolution slide-scanner
- Computer workstation
- A grid for the detectors

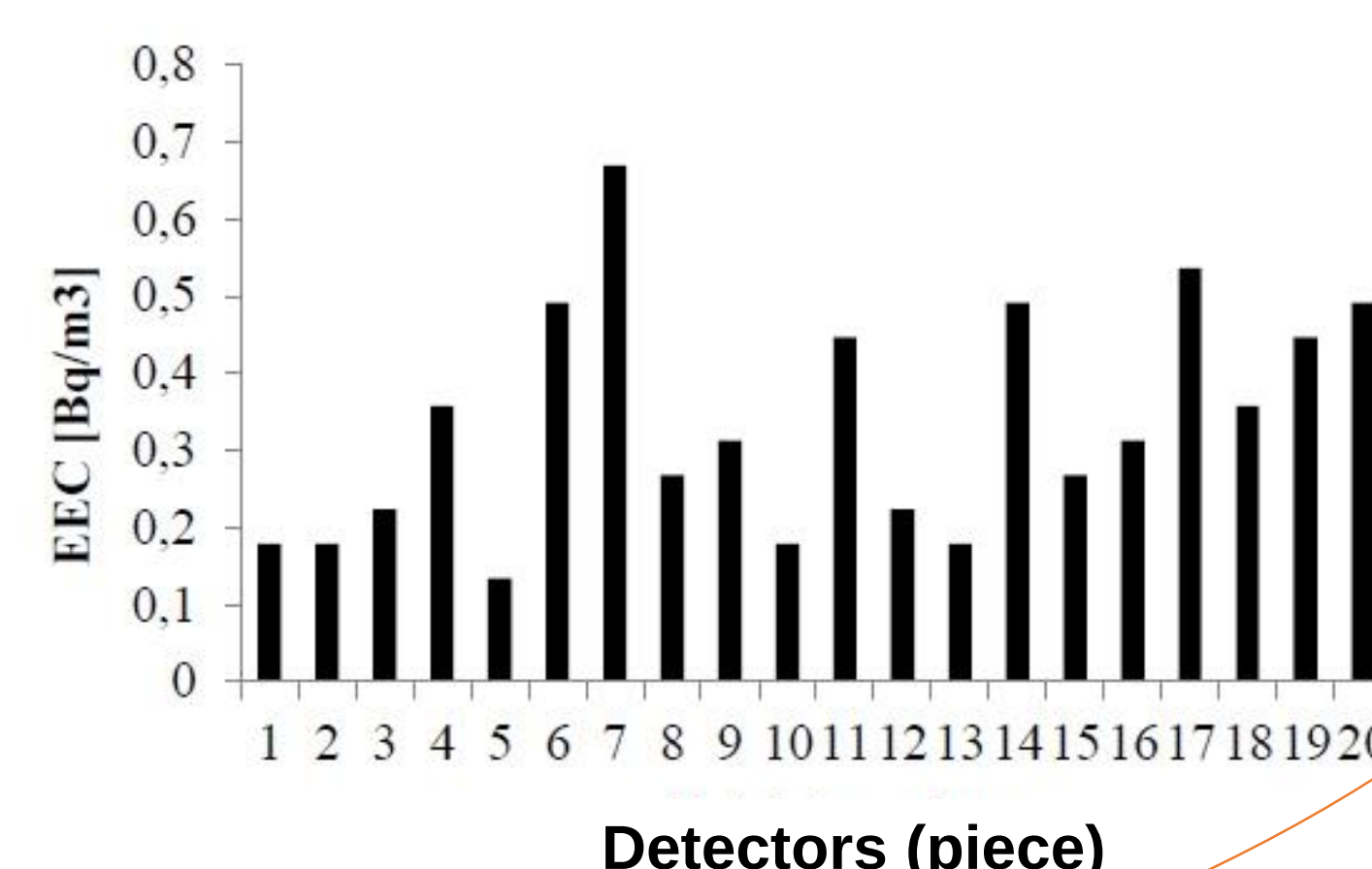
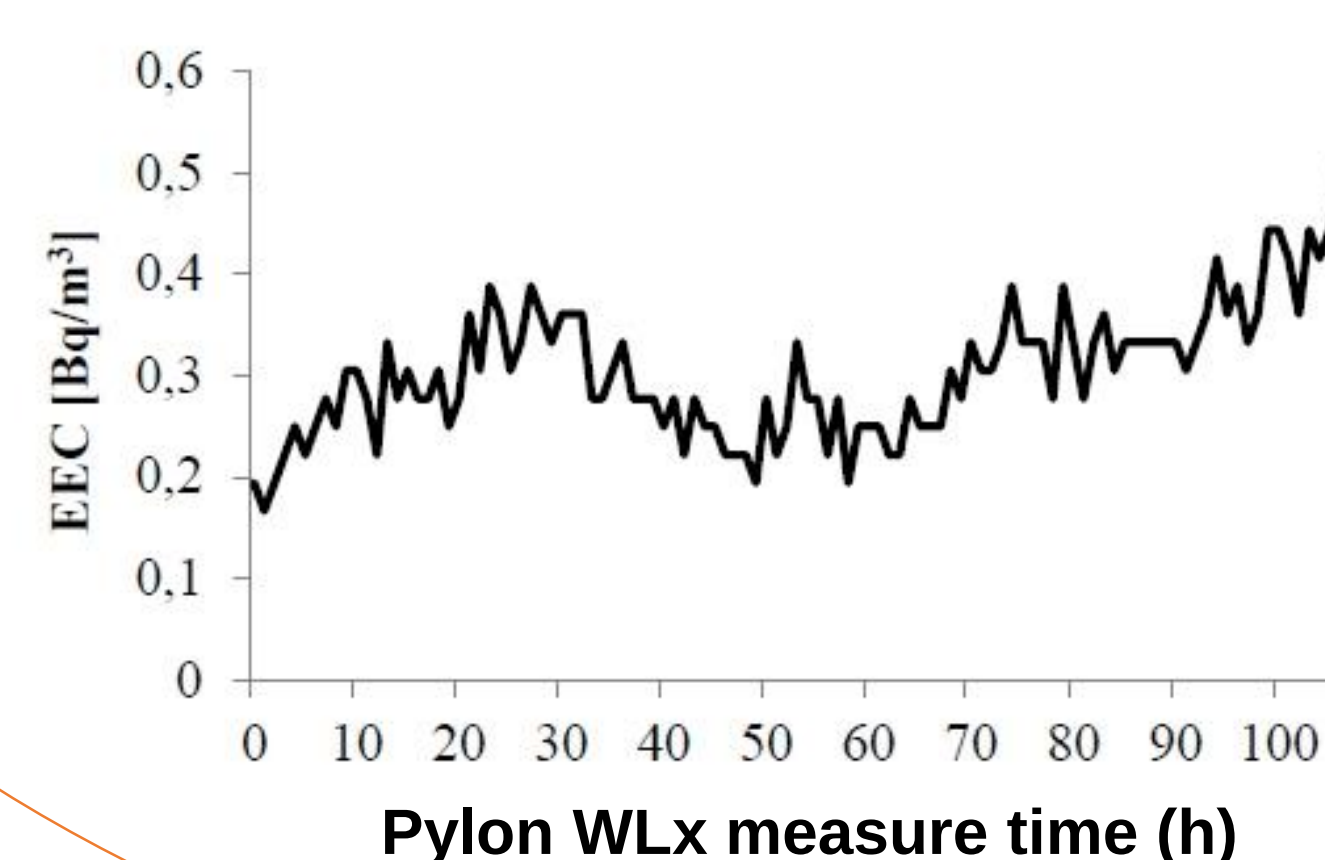
The features of our method:

- Semi-automatic
- Simple use
- The cost isn't too much



Results and conclusion

During the measurements the parameters (temperature, atmospheric pressure, humidity) have been almost constant with slight differences of 1-2 %. Pylon WLx monitor was used and the measurement results of this instrument were compared with the results provided by the track detectors. During the comparison it was found that the measurement results gained by the two instruments showed great correspondence: the difference between the concentration values measured by the two monitors was 10 %.



Summary

From the results it can be seen that the track detectors (Japanese developed) are suitable for the thoron (^{220}Rn) progeny survey and we can evaluate the detectors faster because of our own developed slide-scanner evaluation system.

References

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3. F. Fábián; **CALIBRATION OF CR-39-BASED THORON PROGENY DEVICE**: Radiation Protection Dosimetry 2014; doi: 10.1093/rpd/ncu072