ID příspěvku: **58** Typ: **Prezentácia**

Experimental study of etching condition effects and alpha radiation on TASTRACK PADC detectors

úterý 20. září 2022 11:45 (15 minut)

Compact passive Solid State Nuclear Track Detectors (SSNTD) are suitable for use in fast neutron and ion dosimetry. The TASLImage system used at the Slovak University of Technology in Bratislava utilizes TASTRAK plastic SSNTDs made of poly-allyl diglycol carbonate (PADC). The dose measured by these detectors is estimated from the number of tracks from incident particles, that are visible under the microscope after etching. Two parameters describe the process of etching: the track etch rate, which indicates the velocity of etching along the path of the particle and the bulk etch rate, describing the velocity of etching of the whole surface of the SSNTD. The bulk etch rate is dependent on etching conditions, such as the etching medium, its molarity, duration, and temperature of the etch bath. The change in the bulk etch rate with the change in etching temperature and time (using the 6.25 M NaOH solution) is demonstrated to quantify the effect of not ideal etching on resulting dosimetry quantities. The etching of detectors from two different batches is used to explore the effect of aging. In addition, the relationship between the bulk etch rate and diameters of alpha tracks (delivered by ^{241}Am) is determined. The acquired findings help to estimate the changes in the etching process from a comparison of tracks caused by alpha radiation. Bulk etch rates are determined from the measurement of the weight of detectors before and after etching.

Hlavní autoři: FILOVÁ, Vendula (Institute of Nuclear and Physical Engineering, Faculty of Electrical Engineering and Information Technology, Slovak University of Technology in Bratislava); VRBAN, Branislav (Slovak University of Technology in Bratislava, Slovakia); ČERBA, Štefan (Slovenská technická univerzita v Bratislave); LULEY, Jakub (Slovak University of Technology in Bratislava); NEČAS, Vladimír (Slovak University of Technology Bratislva)

Přednášející: FILOVÁ, Vendula (Institute of Nuclear and Physical Engineering, Faculty of Electrical Engineering and Information Technology, Slovak University of Technology in Bratislava)

Zařazení sekce: Metrológia, meranie a prístrojová technika

Tematická klasifikace: Metrológia, meranie a prístrojová technika