

Soutěž - Comparison of the Background Gamma-ray Spectrum from soil obtained by Direct Measurement and by Calculation using MCNP6 with NaI(Tl) Scintillation Detector

úterý 9. listopadu 2021 16:45 (15 minut)

Efficiency calibration is an essential part of any gamma-spectrometric or non-spectrometric measurement. The article describes all necessary steps leading to the reconstruction of the gamma-ray spectrum from the soil - mathematical calibration of the scintillation detector NaI(Tl) and subsequent optimization of the detector model in the MCNP6 code, determination of radionuclide vector of soil around NPP A1 and V1, calculation of the detector response matrix for selected gamma-ray energies of natural radionuclides in soil using the calculation code MCNP6 and finally the reconstruction of the gamma-ray spectrum. The results were compared in the energy range of 50 - 1620 keV for the spectrum obtained by direct measurement of the soil sample and for the spectrum obtained by calculation using the code MCNP6. The relative deviation in the whole spectrum between direct measurement and calculation is not more than 2 %, which can be considered as the satisfactory result. The scintillation detector model thus created, together with the determined soil radionuclide vector, can be used to calculate the response matrix for any measurement geometry, and thus determine the peak or total measurement efficiency under different conditions in practice in the field of decommissioning. The 2 x 2 inch. NaI(Tl) scintillation detector model thus created, together with the determined radionuclide vector of the soil, can be used to calculate the response matrix for any geometry arrangement, and thus determine the peak or total measurement efficiency under different conditions in practice.

Přihlásit do soutěže

Přihlašuji příspěvek do soutěže o nejlepší přednášku

Hlavní autor: BEDNÁR, Dávid

Spoluautoři: LIŠTJAK, Martin (VUJE, a.s.); NEČAS, Vladimír (ÚJFI FEI STU, Bratislava)

Přednášející: BEDNÁR, Dávid

Zařazení sekce: Nakládání s radioaktivními odpady, vyřazování jaderných zařízení z provozu

Tematická klasifikace: Nakládání s radioaktivními odpady, vyřazování jaderných zařízení z provozu