Multiple Energies Passive Computer Tomography of Nuclear Fuel

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Abstract. The passive algebraic reconstructive tomography allows estimation of the state of the fuel inside fuel assemblies. The analysis of results of reconstruction of radioactivity in fuel pins by volume FA has been carried out. It was suggested for use for an estimation of quality of reconstruction of radioactivity in fuel pins the relative dispersion of a deviation of radioactivity in fuel pins in limits of the tomogram, the relative dispersion of a deviation of radioactivity in fuel pins in limits of one axis , the peak deviation of radioactivity in limits of one axis and a histogram of a deviation of radioactivity in fuel pins. It was offered to use simultaneously for reconstruction of radioactivity results of spectrometer measurements for various energies. The analysis of the submitted histograms has confirmed perceptivity of the idea in use for several energies for restoration of activity.

Keywords: nuclear fuel, gamma-ray emission tomography, irradiated fuel assemblies, CdZnTe-detectors, nondestructive measurement, gamma-ray spectroscopy.

Full text is available on: http://ceser.in/ceserp/index.php/ijts/article/view/5396