PFN Investigation at IREN Resonance Neutron Energy Range

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Investigations of prompt-fission neutron (PFN) emission are important in understanding of the sharing excitation energy between the fission fragments. Experimental activities on PFN emission at JINR are underway for more than 20 years with main focus on investigations of the reactions ^{252}Cf(sf) and ^{235}U(n,f) in the region of the resolved resonances. Resonance region of neutron energies is interesting for testing nuclear scission model. For the ^{235}U(n,f) reaction, strong fluctuations both in the mass of the fission fragments and their mean total kinetic energies, depending on incident neutron energy, were observed. In addition, fluctuations of PFN multiplicity also were observed according to the literature. The goal of the present research is to verify the current knowledge of PFN multiplicity fluctuations and to verify their correlations with properties of fission fragments. The measurements of PFN multiplicity variations in the resonance-neutron induced fission of ^{235}U nuclei revealed a surprising result, which stimulates a new investigation of PFN multiplicity at IREN with new high-efficiency experimental setup.