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**IMPROVEMENTS TO THE TECHNIQUE AND MEASUREMENT OF DELAYED NEUTRON YIELDS IN  $^{232}\text{Th}(\text{P},\text{F})$  AND  $^{238}\text{U}(\text{P},\text{F})$ ,  $^{238}\text{U}(\text{D},\text{F})$  REACTIONS**

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There is described an improved technique for short-lived sources of delayed neutrons studying in compound  $^{233,234,235}\text{Pa}$ ,  $^{236-241}\text{Np}$  nuclei fission at  $^{232}\text{Th}$ ,  $^{235,238}\text{U}$  exposure to a pulsed beam of protons, deuterons and tritons at the tandem electrostatic accelerator EGP-10 [1]. To extend the measuring possibilities to the range of small decay times the electrostatic deflector electronics has been upgraded in order to decrease the current pulse edge to 10 msec. In the preliminary measurements at target irradiation the all-wave neutron counter channel was found to be overloaded with prompt fission neutrons and recovered rather slowly therewith. Therefore, the neutron counter electronics was substituted by the faster one, and the counter was calibrated on monoenergetic neutrons from  $^7\text{Li}(\text{p},\text{n})$  reaction. To identify individual beta decays of fission products by the life-times and provide reliable decomposition of the complex curve of delayed neutrons yield there has been introduced a channel with HPGe detector, which records gamma-ray energy and time distribution. Then there has been performed a series of measurements of absolute total yields of delayed neutrons from fission fragments in  $^{232}\text{Th}(\text{p},\text{f})$  and  $^{238}\text{U}(\text{p},\text{f})$ ,  $^{238}\text{U}(\text{d},\text{f})$  reactions with the projectile particle energies of 10–12 MeV. In the measurements samples of  $^{232}\text{Th}$  and  $^{238}\text{U}$  up to 7 mg/cm<sup>2</sup> thick were used applied onto 50 mu thick tantalum substrates. To monitor the number of fissions in the sample a semiconductor silicon detector of fission fragments was employed. The work was carried out under ISTC financial support (project #2253).

1. Yu.I.Vinogradov, M.F.Andreev, S.N.Abramovich, Yu.M.Bolshakov. Methodical peculiarities of measuring short-lived sources of delayed neutrons at  $^{235,238}\text{U}$ ,  $^{232}\text{Th}$  fission by charged particles. Proc. Of the Int. Conf. On Nuclear Data for Science and Technology. Trieste, Italy, May 19-24, 1997, v.1, p.670-672.