

A QUASI-INFINITE TARGET ^{238}U ON PROTON BEAM

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The problem of efficient utilization of the worked-off nuclear fuel (WNF) has become a basic topic in the discussion of future global energetic last years. Developed countries start to discuss seriously the utilization of electro-nuclear systems (in international terminology: Accelerator Driven Systems – ADS) as an alternative and perspective method of resolution of this problem. A quite energy stiffness of the neutron spectra in the comparison with the divisable one, that would permit instead of the traditional for the nuclear reactors reactions (n, f) , and (n, γ) to use efficiently a complex of multistep cascade reactions, a high energetic proton, mezon and neutron division, and also a threshold reactions of the type (n, xn) associated with the producing of neutrons has been supposed in the project. A neutron spectrum of this type would permit “to burn” efficiently threshold minors of Actinides and transmute the long-living pieces of nuclear division into the WNF downloading in the active zone (AZ) [1, 2].

The project “Energy and Transmutation of Radioactive Waste” is aimed to decide several basic tasks such as follows: a) a development and analyzing of methods and systems of the measurements, concerning the nuclear physics processes’ characteristics, ensuing in the extended Uranium target under the influence of the relativistic particles’ beam, b) a limited modeling of the central area in the target set-up that is a kind of a realistic prototype of the quasi-infinite AZ in nuclear fuel decay scheme and c) Fundamental and applied researches associated with the interactions of the relativistic particles with massive multiple targets having the only aim to test and to modify the existed models and transported codes. Basic scientific and methodological results of the project are discussed in the report (Fig. 1).

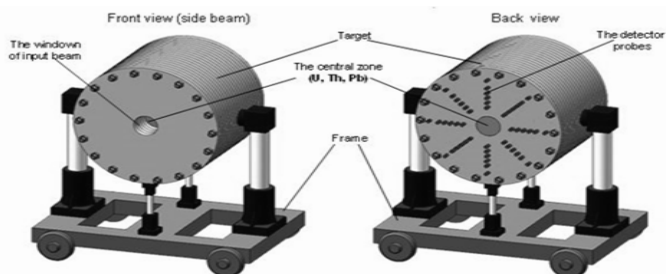


Fig. 1. A common view of the target set up of ^{238}U , established on the transport and adjusted platform in the centre of the proton beam 660 MeV, in the Phasotron LNP, JINR.

1. R.G.Vasilkov *et al.* // *At. Energy*. 1978. V.44. P.4.
2. S.I.Tyutyunnikov // «Nucleus-2015». Sarov. P.257.