

Abstract Submitted  
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**Improvement of Methods Used for Reconstruction of Time Resolved Neutron Energy Spectra in D-D Fusion Reactions**<sup>1</sup> K. REZAC, D. KLIR, P. KUBES, J. KRAVARIK, FEE CTU in Prague, Czech Republic, PF 1000 TEAM, S-300 TEAM — Several methods (Monte Carlo, maximum entropy, genetic algorithm, etc.) for the reconstruction of the time resolved neutron energy spectra have been developed in the last few decades. The energy spectra are reconstructed from time-resolved neutron signals which are recorded by several detectors in one direction at different distances. The basic formulation of the problem as well as test results indicate that the methods could give better results when detectors in the opposite direction are also included. If we want to employ both directions of neutron detection, we must know the relation between the neutrons which are emitted in one direction and the opposite direction. Considering these facts, one of the methods (namely the Monte Carlo reconstruction method) was improved. Our improvement includes the anisotropy in neutron yields and neutron energies. The transformation is based on the scattering theory and it is applied specifically to the D-D fusion reaction. This improved Monte Carlo method has been used to process data from experiments on the PF 1000 plasma focus (IPPLM, Warsaw) and on the S-300 Z-pinch (Kurchatov Institute, Moscow).

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