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MEASUREMENT OF CHARACTERISTICS OF THE NEUTRON FLUX MONITOR OF THE D-D GENERATOR FOR *IN-SITU* CALIBRATION OF ITER NEUTRON DIAGNOSTIC *)

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One of the neutron diagnostics of the ITER tokamak-reactor, which Russia is developing, is the Divertor Neutron Flux Monitor (DNFM). The DNFM diagnostics is used to measure the local fast neutron flux, determine the total neutron plasma output and the released thermonuclear power. The DNFM will be located under the divertor and in close proximity to the plasma. Calibration is planned by the *in-situ* method, by placing powerful compact neutron radiation sources in the vacuum chamber of the tokamak: DD- and DT-neutron generators manufactured by Dukhov VNIIA. To control the full neutron output, generators must be equipped with neutron flux monitors. A great contribution to the accuracy of *in-situ* calibration of ITER detector nodes will be made by the correct selection and preliminary calibration of monitors that will be equipped with neutron generators.

A detector based on a $LaCl_3$(Ce) scintillation crystal is considered as a monitor-spectrometer, in addition to a boron counter, for a DD-neutron generator. Previous studies [1] have shown the prospects of using this crystal for the registration of DD-neutrons (~2.5 MeV). The advantages of this scintillator include high light output and the classical form of the response function during neutron registration. The lower sensitivity to fast DD neutrons in comparison with organic scintillators makes it possible to place the monitor in close proximity to the target by fixing the detector assembly on the body of the neutron generator.

This paper presents a technique for absolute calibration of a neutron spectrometer based on a lanthanum chloride crystal. Calibration of the energy scale and determination of the absolute efficiency of the $LaCl_3$(Ce) scintillation detector was carried out on a reference source of DD-neutrons (~2.5 MeV) at the Mendeleev VNIIM. The calibration technique using neutron generators with a sealed tube and a "thick" target was worked out at the neutron diagnostics stand of SSC RF TRINITI. Based on the measurement results, an independent evaluation of the reaction cross-section $^{35}Cl(n,p)^{35}S_{g.s}$ used to register DD-neutrons was carried out. The analysis of the obtained results was carried out and the data from the database ENDF/B-VIII.0 [2] and published in [3, 4] were compared.

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