CHARACTERISTICS OF THE DETECTORS of the DIAGNOSTICS "NEUTRON SPECTROMETER" OF NEUTRAL PARTICLES ANALYZER for ITER

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This paper presents the results of an experimental study of diagnostic detectors "Neutron spectrometer" on a neutron stand. Diagnostics "Neutron spectrometer"(NS) is a subsystem of diagnostics "Neutral Particles Analyzer" (NPA) and is designed to determine the plasma parameters in the review area of the NPA by measuring the neutron flux with time and energy resolution. Among the parameters – the ion temperature and the relative concentration of tritium in the plasma (fuel ratio). In the course of experiments with detectors, the possibilities of their application to the measurement data are investigated.

In this paper, we study a method to determine the fuel ratio, based on the difference of the NS detectors sensitivity dependence on the neutron energy. Diamond and stilbene neutron detectors are used in diagnostics.

The fuel ratio is determined by measuring the energy distributions of neutron flux generated by DT and DD fusion reactions [1].

As a result, the characteristics of the detectors developed for the diagnostics "Neutron spectrometer" were measured. The experimental technique [2] is developed and presented, and the limits of the determination of the fuel ratio are investigated.

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References

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