Radiation transport analysis FOR ITER diagnostics DNFM detectors characteristics [[1]](#footnote-1)\*)

DOI: 10.34854/ICPAF.2020.47.1.178

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The ITER diagnostics Divertor Neutron Flux Monitor (DNFM) [1] is supposed to measure total neuron yield and fusion power. The major difference of the DNFM from other neutron diagnostics is it’s nearness to the plasma. This location enables in-situ calibration of the DNFM with a neutron generator [2].

In course of development, the initially chosen location on top of a divertor cassette frame appeared to be a subject of contradicting requirements from some ITER subsystems. Computations show, that in the new location heating and radiation loads are lower by an order by magnitude, and that opens possibility to avoid cooling of detector blocks. The computations of neutron transport also revealed, that the neutron fluxes at lower energies are even more lower– almost two orders of magnitude. This provides opportunity to avoid boron shielding on 238U detectors, which has to reduce plutonium production. The design has been drastically simplified. The reduction of neutron fluxes will be compensated with increasing mass of fissionable material in detectors. The report provides the result of neutron load of the DNFM detectors and possible changes in the data acquisition system measurement channels.

В работе были использованы расчеты MCNP [3], а также расчет активации и наработки плутония с помощью FISPACT[4].

References

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1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/XLVII/E/ru/IC-Portnov.docx) [↑](#footnote-ref-1)