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ON POSSIBILITY OF APPLICATION OF INSB-BASED HIGH-TEMPERATURE HALL SENSORS FOR ITER MAGNETIC DIAGNOSTICS

ABSTRACT *We report on irradiation experiments of InSb-based Hall samples at two types of neutron spectrums. One with thermal neutrons (natural neutron spectrum of fission reactor) and second with fast neutrons (filtered spectrum). Fluences in both cases reached almost 10^{18} cm^{-2} and that led to significant decreasing of electron mobility of samples. In case of thermal neutrons, transmutation process led to increasing of electron concentration of about $2.3 \times 10^{18} \text{ cm}^{-3}$. For samples irradiated with fast neutrons, twofold effect was observed: increase in electron concentration for samples with low carrier density and decrease in electron concentration for samples with high carrier density. All results raise important issue, that in case of ITER ex-vessel steady state sensors, research at different spectrum of neutrons are necessary.*

Keywords: *high temperatures, neutron irradiation, Hall sensor, ITER, magnetic diagnostics*