

Radiation damage of video device in a fusion stellarator

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The EDICAM (Event Detection Intelligent Camera) will be used for video diagnostic in the Endelstein 7X. The camera consists of three modules, the Sensor Module (SM) the Image Processing and Control Unit module and the Image Readout Card module. The sensor module of the camera will be located at the plasma facing end of the selected tangential ports. Because of this the SM should operate in harsh environment under neutron and gamma radiation. The gamma and neutron radiation levels and spectrums were calculated by MCNP code. The calculated neutron fluence $3.5 \cdot 10^{13}$ n/cm² (16.7Gy in Si target) for one year operation. The neutron spektrum is rather hard, half of it consists of fast neutrons (2.45MeV) the other half epithermal energy neutrons (0.2 eV-1 MeV). The neutron irradiation was carried out in the BIO testing site of Budapest Neutron Centre where we had good gamma shielding, which allowed to reach the desired yearly neutron fluence and spectrum estimated by MCNP at low gamma background. The SM's dark current was in the centre of interest. Statistical methods were used for the evaluation of the dark current's behavior with different camera exposure times. The measurement showed that SM endures the estimated neutron dose although it will lose a big fraction of it's dynamics.

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