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[US] Effects of neutron irradiation on HV-JFETs

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We had p-type HV-silicon JFETs, fabricated at Brookhaven National Laboratory, irradiated with neutrons at the Triga reactor in JSI, up to a fluence of 1.5×10^{15} neq/cm². Most notably, output characteristics show a dramatic increase of the drain saturation voltage with the irradiation. By means of TCAD simulations, which used the Perugia radiation damage model, we are explaining this effect as due to the charge introduced by the traps, that modifies the electrostatics in sensitive areas of the JFET and limits the hole current toward the drain. Effects of acceptor removal are also visible in the I-V curves.

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