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A Novel Detector for High Flux Thermal Neutrons ELISE MARTIN, SEPTIMIU BALASCUTA, DAVID BOWMAN, CHRIS CRAWFORD, CHARLES FIESELER, NADIA FOMIN, KYLE GRAMMER, GEOFFREY GREENE, SEPPO PENTTILA, NPDGAMMA COLLABORATION — The NPDGamma experiment at the SNS measures the parity-violating gamma asymmetry, A_γ, in the $\vec{n} + p \to d + \gamma$ reaction to set limits to the f_π contribution in the weak hadronic potential. The projected sensitivity is $\delta A_\gamma = 10^{-8}$. To verify we can achieve the required counting statistics we must know the neutron flux. We have built a novel, absolutely calibrated, high dynamic range neutron detector, which uses a boron target in the neutron beam to produce a single, monoenergetic, gamma ray per captured neutron. The gamma rays are then detected by a CsI crystal and viewed by a vacuum photo-diode. The absolute flux and beam profile are obtained by scanning the detector across the beam. In addition to the absolute beam flux measurement, the detector has been used to define the beam position after the reflecting supermirror polarizer. The detector will be used also to align accurately the gamma detector array of the experiment, minimizing false asymmetries. We will describe the neutron detector, its calibration, and results for neutron flux and beam profile data for the FNPB beam line at the SNS, where the NPDGamma experiment is installed.

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