Calculation of the Detector Solid Angles and Geometrical Factors for the NPDGamma Experiment KYLE GRAMMER, University of Tennessee, NPDGAMMA COLLABORATION — The goal of the NPDGamma experiment is to measure the parity-violating asymmetry in γ-ray emission in the capture of polarized neutrons on para-hydrogen. The detector array consists of 48 gain-matched CsI-crystals arranged in 4 rings around the hydrogen target. The detector array has approximately 3π acceptance angle. The sensitivity in the measurement of a physical asymmetry is dependent on detector solid angles and to the position of detectors. The position of detectors is given by geometrical factors. Initial calculations of the geometrical factors were performed with an analog Monte Carlo approach. The geometrical factors and solid angles are modelled in modified MCNPX and calculated to approximately 1% uncertainty and compared to experimental results.

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