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Collimator optimization for BL3: Next generation neutron beam lifetime experiment PAUL HARMSTON, University of Tennessee Knoxville — The BL3 experiment intends to accurately measure the lifetime of the free neutron via the beam method. Previous beam experiments were limited by statistics. A primary goal of BL3 is to reduce statistical and systematic uncertainties to resolve the discrepancy between beam and bottle methods with greater confidence. To evolve our knowledge of systematic effects a solid understanding of the neutron beam spot size on the detector is needed to verify near complete detection. A series of simulations in the ray tracing software MCstas was performed to verify spot size and maximize both the neutron flux and count rate.

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