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Systematic Effects of UCN Trapping in the UCNτ Experiment[1]
CHEN-YU LIU, DANIEL SALVAT, Indiana University, PETE WALSTROM, Los Alamos National Laboratory, UCNτ COLLABORATION — There is a recent disagreement on the mean lifetime of neutron β-decay, as determined by the most precise in-beam measurement and the most precise trap-based measurements. While the precision of the trap technique has reached 1 second and the planned NIST beam experiment will soon catch up to the same level, the discrepancy remains as large as ~ 8 seconds. The immediate goal for the UCNτ experiment is to understand the systematic effects of trap-based experiments, and to investigate sources of neutron loss beyond typical material interactions. We present simulations of UCN trapping in our magneto-gravitational trap, with special attention to the population of quasi-bound neutrons. We also present results of magnetic field mapping and discuss the implications of defects in the trap-as-built.

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Chen-Yu Liu
Indiana University

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