

Abstract Submitted  
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**Limit on parity-violating neutron spin rotation in a liquid  $^4\text{He}$  target** KANGFEI GAN, The George Washington University, NSR-II COLLABORATION — The nucleon-nucleon (NN) weak interaction is one of the more poorly understood areas of the Standard Model. Present theoretical models are essentially phenomenological, and experiments in few-nucleon systems do not determine all of the weak NN amplitudes. We have performed the first phase of a high precision measurement of parity-violating (PV) neutron spin rotation. The rotation angle of transversely polarized cold neutrons passing through a liquid  $^4\text{He}$  target was measured to be  $d\phi/dz = (+1.7 \pm 9.1(\text{stat}) \pm 1.4(\text{sys})) \times 10^{-7}$  rad/m, which is the most precise measurement of PV spin rotation to date. The uncertainty is smaller than current estimates of the range of possible values of  $d\phi/dz$  in the n- $^4\text{He}$  system. The result will be presented along with a discussion of the theoretical motivation, experimental design, analysis for data and systematic effects, and plans for the next phase of the experiment.

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