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**Implementing a New Ion Chamber Design for Neutron Spin Rotation** HANNAH GARDINER, Louisiana State University, EAMON ANDERSON, JASON FRY, ADAM HOLLEY, MIKE SNOW, Indiana University — The quark-quark weak interaction is difficult to measure due to the presence of the strong force. However, low energy neutrons passing through liquid Helium-4 can be used to probe the nucleon-nucleon weak interaction, which is induced by the quark-quark weak interaction. The neutron spin rotation experiment seeks to measure the spin rotation angle of neutrons due to their weak interaction with Helium-4 nuclei. This rotation angle is translated into a neutron flux asymmetry with a neutron polarizer/analyzer pair. A segmented Helium-3 gas ionization chamber was developed to measure the resultant neutron flux. We report on the design and initial tests of that ionization chamber. This work is supported by the National Science Foundation REU program and NSF grant #PHY-0969490.

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