Abstract Submitted
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Measuring scintillation light using Visible Light ALVARO CHAVARRIA, Duke University — A new search for the neutron electric dipole moment (EDM) using ultra cold neutrons proposes an improvement on the neutron EDM by two orders of magnitude over the current limit (to 10^{-28} e*cm). Detection of scintillation light in superfluid ^{4}He is at the heart of this experiment. One possible scheme to detect this light is to use wavelength-shifting fibers in the superfluid ^{4}He to collect the scintillation light and transport it out of the measuring cell. The fiber terminates in a visible light photon counter (VLPC). VLPCs are doped, silicon based, solid state photomultipliers with high quantum efficiency (up to 80%) and high gain (≈40000 electrons per converted photon). Moreover, they are insensitive to magnetic fields and operate at temperatures of ≈6.5K. A test setup has been assembled at Duke University using acrylic cells wrapped in wavelength-shifting fibers that terminate on VLPCs. This setup is being used to evaluate the feasibility of this light detection scheme. The results obtained in multiple experiments done over the past summer (2006) and the current status of the project will be presented at the conference.
Reference:
A New Search for the Neutron Electric Dipole Moment, funding pre-proposal by the EDM collaboration; R. Golub and S. Lamoreaux, Phys. Rep. 237, 1 (1994).

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