Letter of Intent
to the
Los Alamos Neutron Science Center (LANSCE)

Measurement of the Electric Dipole Moment of the Neutron

The EDM Collaboration
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Abstract

We propose to measure the electric dipole moment of the neutron with a sensitivity of 4×10^{-28} $e$cm, a factor of 250 improvement over the current experimental limit. We are requesting beamlines to develop the new experiment. We also indicate the anticipated beam usage during the production data- taking phase of the experiment. Our technique utilizes a 10-cm by 10-cm supermirror guide at the Lujan Center feeding a superthermal UCN source from the upgraded LANSCE spallation source with a fully coupled moderator. Systematic errors are greatly reduced from previous experiments by having a small amount of polarized ^{3}He in the measuring cell as a magnetometer.

Beam Requests for Duration of the Experiment

Year	Months of Use	Required Flux	Beam Size
1998	2	10^{10}n/cm^{2}s, 50°K	1×1cm^2
1999	2	10^{10}n/cm^{2}s, 50°K	1×1cm^2
2000	1	10^{10}n/cm^{2}s, 50°K	1×1cm^2
2001	1	10^{10}n/cm^{2}s, 50°K	1×1cm^2
2002	1	10^{10}n/cm^{2}s, 50°K	1×1cm^2
2003	8	5×10^9n/cm^{2}sÅ @ 8.9Å	10×10cm^2
2004	8	5×10^9n/cm^{2}sÅ @ 8.9Å	10×10cm^2
2005	8	5×10^9n/cm^{2}sÅ @ 8.9Å	10×10cm^2