APR20-2020-000667

Abstract for an Invited Paper
for the APR20 Meeting of
the American Physical Society

New Limit on the Permanent Electric Dipole Moment of ^{129}Xe using ^{3}He Comagnetometry and SQUID Detection

NATASHA SACHDEVA, Northwestern University

We report results of a new technique to measure the electric dipole moment of ^{129}Xe with ^{3}He comagnetometry. Both species are polarized using spin-exchange optical pumping, transferred to a measurement cell, and transported into a magnetically shielded room, where SQUID magnetometers detect free precession in applied electric and magnetic fields. The result from a one week measurement campaign in 2017 and a 2.5 week campaign in 2018, combined with detailed study of systematic effects, is $d_A(^{129}\mathrm{Xe}) = (1.4 \pm 6.6_{\mathrm{stat}} \pm 2.0_{\mathrm{syst}}) \times 10^{-28}$ e cm. This corresponds to an upper limit of $|d_A(^{129}\mathrm{Xe})| < 1.4 \times 10^{-27}$ e cm (95% CL), a factor of five more sensitive than the limit set in 2001.