

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Progress towards an electron electric dipole moment search in Europium-Barium Titanates S. ECKEL, A.O. SUSHKOV, S.K. LAMOREAUX, Yale University — We report on recent progress towards an electron electric dipole moment (EDM) search using mixed Europium Barium Titanates. In particular, we have synthesized and characterized $\text{Eu}_{0.5}\text{Ba}_{0.5}\text{TiO}_3$ ceramics and identified them as a good candidate for a solid state electron EDM search. These samples are ferroelectric below 200 K and paramagnetic above 1.8 K. Because of the spontaneous electric polarization in these ceramics, the seven unpaired $4f$ electrons of the Eu^{2+} ions in the lattice feel a large effective electric field, on the order of 10 MV/cm. The estimated sensitivity due to this large electric field and large densities ($n \approx 10^{22} \text{ cm}^{-3}$) is approximately $d_e \sim 10^{-28} \text{ ecm}$ after ten days of averaging.

Stephen Eckel
Yale University

Date submitted: 20 Nov 2009

Electronic form version 1.4