

Abstract Submitted
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Short-range, spin-dependent interactions of electrons: a sensitive probe for exotic pseudo-Goldstone bosons¹ WILLIAM TERRANO², ERIC ADELBERGER, JOHN LEE, BLAYNE HECKEL, University of Washington at Seattle — We used a torsion pendulum and rotating attractor with 20-pole electron-spin distributions to probe dipole-dipole interactions mediated by exotic pseudo-Goldstone bosons with $m_b c^2 \leq 500 \mu\text{eV}$ and coupling strengths up to 14 orders of magnitude weaker than electromagnetism. Our 95% confidence result indicates that any hidden global symmetry involving electrons must have a symmetry-breaking scale $F \geq 70 \text{ TeV}$, the highest reached in any laboratory experiment. We used an attractor with a 20-pole unpolarized mass distribution to improve laboratory bounds on CP -violating monopole-dipole forces with $1.5 \mu\text{eV} < m_b c^2 < 400 \mu\text{eV}$ by up to a factor of 1000.

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