

Abstract Submitted
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Search for Parity- and Time Reversal-Violating Nuclear Spin-Dependent Interactions in ^{205}TlF OLIVIER GRASDIJK, Yale Univ, DAVID DEMILLE, JAKOB KASTELIC, Yale University, DAVID KAWALL, University of Massachusetts Amherst, STEVE LAMOREAUX, OSKARI TIMGREN, Yale University, KONRAD WENZ, Columbia University, TRISTAN WINICK, University of Massachusetts Amherst, TREVOR WRIGHT, Yale University, TANYA ZELEVINSKY, Columbia University, CENTREX COLLABORATION — Parity (P)- and time reversal (T)-violating interactions are sensitive probes of physics beyond the Standard Model. CeNTREX (Cold molecule Nuclear Time-Reversal Experiment) aims to search for nuclear spin-dependent P- and T-violating interactions, e.g. due to the nuclear Schiff Moment of ^{205}Tl , in the molecule thallium fluoride (TlF). We will look for a P-,T-violating interaction by sending a cryogenic molecular beam of TlF through an interaction region where the direction of an electric field, relative to the molecular rotational angular momentum, is alternately switched. This will generate a change in the nuclear spin precession frequency proportional to the Schiff moment. We project a significant improvement in sensitivity compared to the current state of the art. Instrumental in achieving this sensitivity is the use of optical cycling for efficient detection, rotational cooling, an electrostatic molecular lens, and a 3 meter long interaction region. We describe the recent progress and current status of the CeNTREX experiment.

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