Abstract Submitted
for the DAMOP20 Meeting of
The American Physical Society

Progress of CeNTREX: Cold Molecule Nuclear Time Reversal Experiment MICHAEL AITKEN, Columbia University , OLIVIER GRASDIJK, JAKOB KASTELIC, OSKARI TIMGREN, Yale University, KONRAD WENZ, Columbia University, TRISTAN WINICK, University of Massachusetts Amherst, TREVOR WRIGHT, DAVID DEMILLE, Yale University , DAVID KAWALL, University of Massachusetts Amherst, STEVE LAMOREAUX, Yale University, TANYA ZELEVINSKY, Columbia University, CENTREX COLLABORATION —
The baryon asymmetry of the universethe presence of matter in far greater abundance than antimatteris an ongoing scientific mystery. Since the Big Bang is expected to have produced matter and antimatter in equal amounts, physicists have developed theories to account for the processes that have led to this asymmetry. Many of these theories predict a violation of the T (time reversal) symmetry at levels that exceed the Standard Model predictions. The existence of a nuclear Schiff moment is an example of such a T violating phenomenon. Our experiment, the Cold Molecule Time Reversal Experiment, or CeNTREX, is designed to measure the Schiff moment of the thallium nucleus. I present progress towards this measurement, including a cryogenic buffer gas beam of thallium fluoride (TlF) molecules and spectroscopic characterization of TlF with an ultraviolet laser system. Additionally, I report on future steps and the experimental layout for measuring the Schiff moment of thallium using TlF.

Michael Aitken
Columbia University

Date submitted: 31 Jan 2020 Electronic form version 1.4