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**Twelve-fold increase in the number of usable ThO molecules for the ACME electron electric dipole measurement through STIRAP**[1] C. D. PANDA, Harvard University, Department of Physics, B. R. O'LEARY, Z. LASNER, Yale University, Department of Physics, E. S. PETRIK, Harvard University, Department of Physics, A. D. WEST, D. DEMILLE, Yale University, Department of Physics, J. M. DOYLE, G. GABRIELSE, Harvard University, Department of Physics — The ACME Collaboration recently reported an order of magnitude improved limit on the electric dipole moment of the electron (eEDM) (ACME collaboration, Science **343** (2014), 269−272), setting more stringent constraints on many time reversal (T) violating extensions to the Standard Model. The experiment was performed using spin precession measurements in a molecular beam of thorium oxide. We report here on a new method of preparing the coherent spin superposition state that serves as the initial state of the spin precession measurement using STImulated Raman Adiabatic Passage (STIRAP). We demonstrate a transfer efficiency of 75%, giving a twelve-fold increase in signal. We discuss the particularities of implementing STIRAP in the ACME measurement and the methods we have used to overcome various challenges.

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Cristian Panda
Harvard University, Department of Physics

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