Abstract Submitted
for the DAMOP13 Meeting of
The American Physical Society

Progress on a higher precision measurement of the n=2 triplet P fine structure of atomic helium E.B. DAVIDSON, K. KATO, H. BEICA, M.C. GEORGE, A.C. VUTHA, M. WEEL, C.H. STORRY, E.A. HESSELS, York University — Precision measurement of the 2^3P fine structure of atomic helium, when combined with precise theory, can be used to determine the value of the fine-structure constant. We report on progress towards an improved measurement using a new technique which reduces systematic effects, while improving the signal-to-noise ratio. An intense beam of 2^3S metastable helium atoms is created in a hollow-cathode liquid-nitrogen-cooled DC-discharge source. The atoms are laser excited to the 2^3P state and microwave transitions are driven between the 2^3P states using the Ramsey method of separated oscillatory fields (SOF). Atoms which complete the SOF sequence are shelved into the 2^3S m=-1 metastable state using laser transitions through the 3^3S state. These m=-1 atoms can be detected with high efficiency.

Eric Hessels
York University

Date submitted: 30 Jan 2013 Electronic form version 1.4