Abstract Submitted
for the DAMOP07 Meeting of
The American Physical Society

Searching for exotic particle emission in the decay of trapped Rb isomers T. KONG, R. PITCAIRN, UBC, A. GORELOV, SFU, J. FUNG, C. HÖHR, M. PEARSON, J. BEHR, TRIUMF, Vancouver, Canada — During the decay of nuclear isomers, the momentum of the recoil nucleus will change if any massive particle is emitted instead of a Gamma ray. The Rb isomer transitions are sensitive to a mass range between 20 to 550 keV/c^2. This range covers masses for pseudoscalar axions which were proposed to solve the "strong CP" problem and for scalar particles. In our experiment, trapped metastable Rb isomers will be used to search for these particles. To measure the recoiling momentum, the daughter Rb atoms are photo-ionized. The resulting electrons and photo-ions are detected in a MOTRIMS setup, where charged particles are guided onto time and position sensitive detectors by means of electric fields. The photo-ionization involves firstly the excitation from 5S state to 5D state by Doppler-free two-photon transition using an MBR-110 laser at 778nm, and then ionization to the continuum by a broadband diode laser bar.

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Date submitted: 01 Feb 2007 Electronic form version 1.4