Abstract Submitted
for the DAMOP19 Meeting of
The American Physical Society

Laser cooling radium ions MINGYU FAN, CRAIG A. HOLLIMAN, ANNA L. WANG, ANDREW M. JAYICH, University of California, Santa Barbara — The unstable radium nucleus is appealing for probing new physics due to its large mass, octupole deformation and energy level structure. Ion traps, with long hold times and low particle numbers, are excellent for work with radioactive species, such as radium and radium-based molecular ions, where low activity, and hence low total numbers, is desirable. We laser cooled $^{226}Ra^{+}$ to form Coulomb crystals in a linear Paul trap. With a single laser-cooled radium ion we measured the $7p\ ^2P_{1/2}$ state branching fractions to the ground state and a metastable excited state. We measured the $7s\ ^2S_{1/2} \rightarrow 7p\ ^2P_{1/2}$ transition frequency of $^{226}Ra^{+}$ using a nearby tellurium reference line, which provides a convenient frequency reference for this radioactive element. In a chain of laser-cooled radium ions we have produced radium-based molecular ions which may hold promise for precision measurement.

Mingyu Fan
University of California, Santa Barbara

Date submitted: 01 Feb 2019 Electronic form version 1.4