Abstract Submitted
for the DAMOP10 Meeting of
The American Physical Society

Femto-second Frequency Comb Spectroscopy of Ytterbium Ions[1]
MARTIN SCHAUER, Los Alamos National Laboratory, JEREMY DANIELSON, SAIDUR RAHAMAN, MICHAEL SCHACHT, BAOZHOU SUN, JIEPENG ZHANG, XINXIN ZHAO, JUSTIN TORGERSON — Forbidden optical transitions in trapped ions are of great interest for high precision spectroscopic applications. We report on work to drive the $^2S_{1/2}(F=0)$ – $^2D_{3/2}(F=2)$ electric quadrupole transition in $^{171}Yb^+$ ions with light derived directly from a femto-second frequency comb. To this end we have trapped and laser-cooled a single $^{171}Yb^+$ ion and minimized its driven micromotion. We have developed the infrastructure to manipulate and measure the quantum state of the ion, and we have produced light at the quadrupole transition wavelength of 435.5 nm by means of a femtosecond frequency comb. We will present results from all of this work as well as initial measurements of the quadrupole transition.

[1]This work is supported by LANL Laboratory Directed R&D.

Martin Schauer
Los Alamos National Laboratory

Date submitted: 22 Jan 2010 Electronic form version 1.4