

Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

Anomalies in QED corrections to the 3d states of K-like ions¹

JONATHAN SAPIRSTEIN, University of Notre Dame, KWOK-TSANG CHENG, Lawrence Livermore National Laboratory — Higher-order QED corrections to atomic energy levels from electron correlations are typically smaller in magnitudes than the lowest-order radiative corrections. However, such is not the case for the 3d states of K-like ions, as screened QED corrections are enhanced by interactions with the 1s – 3p core electrons which have much larger one-loop self-energy and vacuum polarization corrections than the 3d valence electrons. In this work, screened vacuum polarization corrections are found to be almost two orders of magnitudes larger than the lowest-order corrections for the 3d ground states of K-like krypton. Similar enhancements should exist in the self-energies of these 3d states.

¹Work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

Kwok-Tsang Cheng
Lawrence Livermore National Laboratory

Date submitted: 27 Jan 2017

Electronic form version 1.4