Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

Efimov States of Strongly Interacting Photons MICHAEL GULLANS, JQI, QuICS, NIST, SEBASTIAN DIEHL, University of Cologne, SETH RITTENHOUSE, US Naval Academy, PAUL JULIENNE, JQI, NIST, ALEXEY GORSHKOV, JACOB TAYLOR, JQI, QuICS, NIST — We introduce a new system to study Efimov physics based on interacting photons in cold gases of Rydberg atoms. We realize an isotropic three dimensional scattering problem by equalizing the longitudinal effective mass of the photons, arising from dispersive effects, with the transverse mass of the photons, arising from diffraction effects. We find the universal three-body parameter in this regime and characterize three-body recombination processes. We find that the Efimov bound states can be directly observed in the photonic transmission through the medium. These effects are realizable in high-density atomic ensembles and can be naturally extended to probe few-body universality beyond three bodies, as well as the role of Efimov physics in the many-body regime.

Michael Gullans
NIST - Natl Inst of Stds & Tech

Date submitted: 11 Apr 2017 Electronic form version 1.4