

Abstract Submitted  
for the DAMOP16 Meeting of  
The American Physical Society

**Non-linear optics of ultrastrongly coupled cavity polaritons**

MICHAEL CRESCIMANNO, Dept. of Physics and Astronomy, Youngstown State University, BIN LIU, MICHAEL MCMASTER, KENNETH SINGER, Dept. of Physics, Case Western Reserve University — Experiments at CWRU have developed organic cavity polaritons that display world-record vacuum Rabi splittings of more than an eV. This ultrastrongly coupled polaritonic matter is a new regime for exploring non-linear optical effects. We apply quantum optics theory to quantitatively determine various non-linear optical effects including types of low harmonic generation (SHG and THG) in single and double cavity polariton systems. Ultrastrongly coupled photon-matter systems such as these may be the foundation for technologies including low-power optical switching and computing.

Michael Crescimanno  
Dept. of Physics and Astronomy, Youngstown State University

Date submitted: 28 Jan 2016

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