

Abstract Submitted  
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**Lessons learned from the observation of harmonic generation in ultrastrongly coupled polaritonic matter**<sup>1</sup> MICHAEL CRESCIMANNO, Dept. of Physics and Astro, Youngstown State University, BIN LIU, SAMUEL SCHWAB, KENNETH SINGER, Department of Physics, Case Western Reserve University — Recent experimental observation of harmonic generation in ultrastrongly coupled cavity polaritonic matter indicates a modification of the usual treatment of how non-linear optical (NLO) response is modulated by an optical environment. We outline the different quantum optical theoretical approaches to the NLO, describe the recent relevant experimental results and use these to discern between theoretical models.

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