Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

**Thiol-Ene Networks for Photon Upconversion** JOSEPH LOTT, ABAGAIL JENTSCH, The University of Southern Mississippi — Photon upconversion via the mechanism of triplet-triplet annihilation (TTA) offers the prospect of employing low-power and non-coherent excitation sources to drive the upconversion process. Solid-state materials capable of TTA present several significant challenges including limited solubility of the required chromophores and reduced molecular diffusion. Owing to the wide range of chemical compositions, tunable mechanical properties, and the ease of processing, polymeric materials have been at the forefront of solid-state materials for TTA. This study focuses on the use of thiol-ene 'click' chemistry to create elastomeric films for TTA. Functionalized derivatives of 9,10-diphenylanthracene bearing two vinyl groups were synthesized and covalently incorporated into thiol-ene films, along with palladium (II) octaethylporphine as a sensitizing chromophore. Both emitter and sensitizer concentrations were systematically varied. The network formation was monitored using FTIR measurements and leaching experiments were conducted to quantify the amount of emitter chromophores not bonded into the network. The thermal and mechanical properties of the films were characterized using TGA, DSC, and DMTA. The upconverting performance was gauged using steady-state photoluminescence and lifetime measurements.

Joseph Lott
The University of Southern Mississippi

Date submitted: 11 Nov 2016 Electronic form version 1.4