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Quenching of two-photon pumped fluorescence in an organic dye molecule DAVID PIKAS, University of Dayton, MARK WALKER, Anteon Corporation, CHRISTOPHER BREWER, Air Force Research Laboratory, BALA SANKARAN, Anteon Corporation, LOON-SENG TAN, RACHEL JAKUBIAK, Air Force Research Laboratory, SEAN KIRKPATRICK, University of Georgia, PETER POWERS, University of Dayton — Organic materials exhibiting strong two-photon absorption cross-sections and subsequent up-converted fluorescence have been targeted for use in a variety of applications including optical data storage, nondestructive imaging, frequency up-converted lasing, and microfabrication. The nonlinear photophysical properties of a two-photon absorbing chromophore, AF455, were examined through the use of nonlinear fluorescence and z-scan experiments. Experiments were performed on AF455 in an assortment of solvents and it has been determined that the two-photon emission properties of the chromophore are affected by the solvent environment. The polarity of the solvent caused a shift in the fluorescence spectrum and solvent mixtures containing carbon disulfide experienced a significant quenching of the fluorescence emission. Both of these effects are consistent with what has been studied in linear fluorescence spectroscopy, however, they are not well-studied with respect to two-photon fluorescence. We will present the initial results of our work on this topic and also discuss the effect of the solvent on the nonlinear optical properties of the chromophore.

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