Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Gain enhancement in photorefractive polymers CARL LIEBIG, STEVEN BULLER, Air Force Research Laboratory, PARTHA BANERJEE, University of Dayton, SERGEY BASUN, Air Force Research Laboratory, PIERRE BLANCHE, University of Arizona, JAYAN THOMAS, University of Central Florida (CREOL), COREY CHRISTENSON, NASSER PEYGHAMBARIAN, University of Arizona, DEAN EVANS, Air Force Research Laboratory — Photorefractive (PR) polymer materials have shown that they can be successfully used in display applications due to a diffraction efficiency that is close to unity [1]. The polymers rely on the cooperation between several components in order to generate the charge carriers, space-charge field, and the refractive index change as required for both diffractive and beam-coupling applications. The multi-component approach has several unforeseen consequences, such as multiple PR gratings (hole and electron) and sub-optimal phase shifts which decrease the potential (PR) gain [2]. We show that by applying electric fields close to the breakdown potential to PR polymers, the decreased beam coupling and diffraction efficiency can be overcome by reducing the grating competition (hole vs. electron) leading to an enhanced PR gain/efficiency [3].

[1] P. A. Blanche, et al., Nature **468**, 80-83 (2010).
[2] P. P. Banerjee, et al., J. Appl. Phys. **111**, 013108 (2012).
[3] C. M. Liebig, et al., Opt. Exp. (In press 2013).

Dean Evans
Air Force Research Laboratory

Date submitted: 15 Nov 2013 Electronic form version 1.4