



Paper

Select Language ▼

[Translator Disclaimer](#)

25 September 2013

Enhanced gain dynamics in photorefractive polymers

C. M. Liebig ([/profile/Carl.Liebig-97179](#)), *S. Basun*, *S. S. Buller*, *D. R. Evans* ([/profile/Dean.Evans-30524](#)), *P. P. Banerjee* ([/profile/Partha.Banerjee-10642](#)), *P. A. Blanche* ([/profile/Pierre.Blanche-17183](#)), *C. W. Christenson*, *N. Peyghambarian*, *J. Thomas* ([/profile/Jayan.Thomas-25579](#))

[Author Affiliations +](#) (.)

Proceedings Volume 8847, Photonic Fiber and Crystal Devices: Advances in Materials and Innovations in Device Applications VII; [/conference-proceedings-of-spie/8847.toc](#) 88470A (2013)
<https://doi.org/10.1117/12.2023404> (<https://doi.org/10.1117/12.2023404>)
Event: [SPIE Optical Engineering + Applications](#) ([/conference-proceedings-of-spie/browse/SPIE-Optics-Photonics/SPIE-Optical-Engineering-Applications/2013](#)), 2013, San Diego, California, United States

ARTICLE

CITED BY

PROCEEDINGS
6 PAGES

DOWNLOAD PAPER

SAVE TO MY LIBRARY

SHARE

GET CITATION

Abstract

The complexity of photorefractive polymers arises from multiple contributions to the photo-induced index grating. Analysis of the time dynamics of the two-beam coupling signal is used to extract information about the charge species responsible for the grating formation. It has been shown in a commonly used photorefractive polymer at moderate applied electric fields, the primary charge carriers (holes) establish an initial grating which, however, are followed by a subsequent competing grating (electrons) that decreases the two-beam coupling efficiency. We show by upon using higher applied bias fields, gain enhancement can be achieved by eliminating the electron grating contribution and returning to hole gratings only.

© (2013) COPYRIGHT Society of Photo-Optical Instrumentation Engineers (SPIE). Downloading of the abstract is permitted for personal use only.

Citation [Download Citation ▼](#)

C. M. Liebig ([/profile/Carl.Liebig-97179](#)), *S. Basun*, *S. S. Buller*, *D. R. Evans* ([/profile/Dean.Evans-30524](#)), *P. P. Banerjee* ([/profile/Partha.Banerjee-10642](#)), *P. A. Blanche* ([/profile/Pierre.Blanche-17183](#)), *C. W. Christenson*, *N. Peyghambarian*, and *J. Thomas* ([/profile/Jayan.Thomas-25579](#)) "Enhanced gain dynamics in photorefractive polymers", Proc. SPIE 8847, Photonic Fiber and Crystal Devices: Advances in Materials and Innovations in Device Applications VII, 88470A (25 September 2013); <https://doi.org/10.1117/12.2023404> (<https://doi.org/10.1117/12.2023404>).

ACCESS THE FULL ARTICLE

PERSONAL SIGN IN

Full access may be available with your subscription

Email or Username

[Forgot your username?](#) (<https://spie.org/account/forgotusername?redir=https%3a%2f%2fwww.spiedigitallibrary.org%2fconference-proceedings-of-spie%2f8847%2f1%2fEnhanced-gain-dynamics-in-photorefractive->

PURCHASE THIS CONTENT

[INTERESTED IN A FREE CORPORATE TRIAL?](#)
[\(/institutionaltrial\)](#)

SUBSCRIBE TO DIGITAL LIBRARY

Advertisement

Advertisement

KEYWORDS

[Electrons](#) ([/search?keyword=Electrons](#))

[Polymers](#) ([/search?keyword=Polymers](#))

--

Password

☐ Show

☐ Keep me signed in ?

SIGN IN

No SPIE account? [Create an account](https://spie.org/account/create/accountinfo?webSyncID=aa71bb60-0ed2-3bb6-40ce-be459654d11c&sessionGUID=ece61a27-8cf74ea30c36a34)
([https://spie.org/account/create/accountinfo?](https://spie.org/account/create/accountinfo?webSyncID=aa71bb60-0ed2-3bb6-40ce-be459654d11c&sessionGUID=ece61a27-8cf74ea30c36a34)
[webSyncID=aa71bb60-0ed2-3bb6-40ce-](https://spie.org/account/create/accountinfo?webSyncID=aa71bb60-0ed2-3bb6-40ce-be459654d11c&sessionGUID=ece61a27-8cf74ea30c36a34)
[be459654d11c&sessionGUID=ece61a27-8cf](https://spie.org/account/create/accountinfo?webSyncID=aa71bb60-0ed2-3bb6-40ce-be459654d11c&sessionGUID=ece61a27-8cf74ea30c36a34)
[74ea30c36a34](https://spie.org/account/create/accountinfo?webSyncID=aa71bb60-0ed2-3bb6-40ce-be459654d11c&sessionGUID=ece61a27-8cf74ea30c36a34))

Institutional Access:

[Sign in with your institutional credentials](https://account.institutionalsignin?redirect=https%3a%2f%2fwww.spiedigitallibrary.org%2fconference-proceedings-of-spie%2f8847%2f1%2fEnhanced-gain-dynamics-in-photorefractive-polymers%2f10.1117%2f12.20232404.short)
(/Account/institutionalsignin?
redirect=https%3a%2f%2fwww.spiedigitallibrary.org%2fconference-
proceedings-of-spie%2f8847%2f1%2fEnhanced-gain-
dynamics-in-photorefractive-
polymers%2f10.1117%2f12.20232404.short)

50 downloads per 1-year subscription

Members: \$195 [ADD TO CART](#)
Non-members: \$335 [\(/shoppingcart?
fuseaction=cartadd](/shoppingcart?fuseaction=cartadd)

25 downloads per 1 - year subscription

Members: \$145	ADD TO CART
Non-members: \$250	(/shoppingcart? fuseaction=cartadd

PURCHASE SINGLE ARTICLE

Includes PDF, HTML & Video, when available	
Members: \$17.00	ADD TO CART
Non-members: \$21.00	(/shoppingcart?urlId=)

Photorefractive polymers (/search?keyword=Photorefractive polymers)
=DLX&qty=50)

Electroluminescent displays (/search?keyword=Electroluminescent displays).

<https://www.dps.ny.gov/search?keyword=lons>

Neodymium (/search?keyword=Neodymium)

Chromophores (/search?keyword=Chromophores)

[Show All Keywords](#)

RELATED CONTENT

[Optimization of the efficiencies of photorefractive polymers correlations between... \(/conference-proceedings-of-spie/4918/0000/Optimization-of-the-efficiencies-of-photorefractive-polymers--correlations-between/10.1117/12.483059.full\)](#)

Proceedings of SPIE (September 17 2002)

Record-high intrinsic hyperpolarizabilities for polymeric electro-optic modulators (/conference-proceedings-of-spie/6713/671303/Record-high-intrinsic-hyperpolarizabilities-for-polymeric-electro-optic-modulators/10.1117/12.731349.full)

Proceedings of SPIE (September 26 2007)

Nonlinear optical (NLO) and luminescent properties of hybrid siloxane oxide.../(conference-proceedings-of-spie/2288/0000/Nonlinear-optical-NLO-and-luminescent-properties-of-hybrid-siloxane-oxide/10.1117/12.188955.full)

Proceedings of SPIE (October 13 1994)

An athermal design on LPG-based tunable filter (/conference-proceedings-of-spie/5560/0000/An-athermal-design-on-LPG-based-tunable-filter/10.1117/12.558657.full)

Proceedings of SPIE (October 22 2004)

Effect of polar additives on hole mobilities in photorefractive polymers
(/conference-proceedings-of-spie/3144/0000/Effect-of-polar-additives-on-hole-mobilities-in-photorefractive-

[polymers/10.1117/12.290240.full](#))

Proceedings of SPIE (October 09 1997)

New organic photorefractive material composed of a charge transporting dendrimer... (/conference-proceedings-of-spie/3799/0000/New-organic-photorefractive-material-composed-of-a-charge-transporting-dendrimer/10.1117/12.363916.full)

Proceedings of SPIE (October 05 1999)

A novel approach to achieve highly efficient nonlinear optical polymers... (/conference-proceedings-of-spie/5935/593505/A-novel-approach-to-achieve-highly-efficient-nonlinear-optical-polymers/10.1117/12.621324.full)

Proceedings of SPIE (August 30 2005)



[Subscribe to Digital Library \(/subscribe-page\)](#)



[Receive Erratum Email Alert \(\)](#)