

**Reversible holography and optical phase conjugation for image formation/correction using highly efficient organic photorefractive polymers.**

José-Luis Maldonado, Víctor-Manuel Herrera-Ambriz, Mario Rodríguez, Gabriel Ramos-Ortíz, Marco-Antonio Meneses-Nava, Oracio Barbosa-García, Rosa Santillan, Norberto Farfán.

Journal of Applied Research and Technology. Volume 13, Issue 6, December 2015, Pages 537–542. Lasers in Optics

[doi:10.1016/j.jart.2015.10.007](https://doi.org/10.1016/j.jart.2015.10.007)

**Abstract.**

In this work, we report the reversible reconstruction of holographic and distorted transmission images through the four wave mixing (FWM) technique and optical phase conjugation (OPC), an alternative method to adaptive optics, by using highly efficient Photorefractive (PR) polymers fabricated in our laboratories. These PR polymers are based on our synthesized nonlinear chromophore 4-[4-(diethylamino)-2-hydroxybenzylideneamino] benzonitrile (Dc). For the PR devices, diffraction efficiencies as high as 90% at 25 wt.% doping level of Dc at an external applied electric field (Eext) around 56 V/μm are achieved. The reconstruction implementation is simple, of low cost, all-optical and it is capable of recovering 90% of the original images. The real-time holographic experiments were performed at Eext of just 27 V/μm, which is one of the lowest reported values. Reversible holographic imaging is showed with a rise-time around 0.35 s.

**Keywords**

Real-time reconstructions; Photorefractive polymers; Optical phase conjugation