Abstract Submitted
for the OSS11 Meeting of
The American Physical Society

Fabrication of Microlens Arrays on Layered Polymers[1] DUSTIN HORVATH, TOM ODER, Youngstown State University — Microlens arrays have numerous applications they offer in many areas, such as optical communication, optical computing, and for collecting light power needed in photovoltaics and laser beam shaping. Microlens made out of polymer Gradient Refractive INdex (GRIN) materials can eliminate spherical aberration, which is generally reduced by designing the lens with aspheric surfaces. At the micro and nano scale, aspheric surfaces are hard to fabricate. The goal of this project was to fabricate arrays of microlens on GRIN polymer materials by photolithography and plasma dry-etching, creating lenses with axially-terminating edges. Lenses produced in this manner ideally correct for spherical aberration. We were able to successfully fabricate microlens arrays in multilayer polymer, though dry etching with Ar/O_2 gas. The lenses were characterized using atomic force microscopy and scanning electron microscope. The diameters of these microlenses ranged from 20 – 80 μm, a height of 3-5 μm and an estimated focal length of about 50 μm. In this presentation, methods for improving out fabrication process as well as optically characterizing the microlens arrays will be discussed.

[1]We acknowledge support of funds from the NSF Science and Technology Center (#0423914) and from the State of Ohio (Third Frontier).

Tom Oder
Youngstown State University

Date submitted: 25 Mar 2011 Electronic form version 1.4