

Abstract Submitted
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MicroLens Fabrication by Fluid Deposition of Curable Optical Polymers PAUL RUGHEIMER, CAMERON CHEN, YVES IDZERDA, Montana State University — We utilize a Fluid Microplotter instrument to produce microlenses fabricated from UV-curable polymers with a variety of focal lengths and diameters. The diameters are as small as 10 microns and focal lengths range controllably from 25 microns to several hundred microns. Microlenses such as these are of interest to optics companies for use with diode laser products, for coupling light into waveguides, fiber optics, and other optical components. In addition to precise and repeatable control of the position, size, and focal length of the lenses, we are able to produce them in moderately large arrays consisting of hundreds of lenses, each with a user-defined location. We dispense fluid from a piezoelectrically driven glass micropipette attached to a robotic positioner. Through electronic and positional control of the pipette we are able to precisely vary the position, size, and volume of the lenses. By varying the temperature and surface coatings on the substrate we are able to alter the wetting properties and further control the size and focal length of the lenses. Fabrication and physical properties of the lenses will be discussed as well as preliminary results of the lenses in a prototype device scheduled for future production by a commercial optics company.

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