

## Experimental Study of Tunable Layout Printed Fresnel Lens Structure Based on Dye Doped Liquid Crystal

**Authors :** M. Javadzadeh, H. Khoshsima

**Abstract :** In this article, we present a layout printing way for producing Fresnel zone on 1294-1b doped liquid crystal with Methyl-Red azo dye. We made a Fresnel zone mask with 25 zones and radius of 5 mm using lithography technique. With layout printing way, we recorded mask's pattern on cell with  $\lambda=532$  nm solid-state diode pump laser. By recording Fresnel zone pattern on cell and making Fresnel pattern on the surface of cell, odd and even zones, will form. The printed pattern, because of Azo dye's photoisomerization, was permanent. Experimentally, we saw focal length tunability from 32 cm to 43 cm.

**Keywords :** liquid crystal, lens, Fresnel zone, diffraction, Fresnel lens

**Conference Title :** ICLC 2018 : International Conference on Liquid Crystals

**Conference Location :** Paris, France

**Conference Dates :** June 25-26, 2018