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Write – Read all-Optical System Based on Diffraction Ring Patterns in Aloe, Cresson and Taramira Vegetable Oils.

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Abstract

Multiple diffraction ring patterns appeared in Aloe , Cresson and Taramira oils under irradiation with cw blue (473 nm) laser light beam . No ring patterns appeared in these oils using the green cw (532 nm) and red cw (635nm) laser light beams . As a result of irradiation of these oils with the blue beam together with the green or with red beam or with both green and red beams together, blue and green , blue and red , and blue , green and red rings appeared respectively at very low input powers of the green and red beams . The number of rings produced by the green and red lights are totally controlled by the blue beam input power and not by their input powers . By this technique ,we have established a write (by the blue beam) – Read (by the green and red beams) all optical system in these three oils .

Keywords: Vegetable oils, Diffraction rings, Write – read all optical system, nonlinear optics.

Introduction: Materials with third-order optical nonlinearities have been investigated extensively for their applications in high density optical data storage, optical signal processing, optical computing ,optical phase conjugation ,high-speed all optical switches, optical bistability, optical limiting devices and other nonlinear optical (NLO)devices [1-5]. Self – induced nonlinear index changes in different media are due generally to dispersive and absorptive effects respectively[6].These two branches are classified according to relation between incident laser beam frequency , ω , and the nearest transition in the medium . First , when ω is far removed from any resonance absorption line of the medium , then the nonlinear