The self-focusing and the optical breathers in tunable waveguide arrays

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A voltage-controlled waveguide array in a planar nematic liquid crystal is employed to investigate the phenomena of self-focusing and optical breathers. The multiple focal points appear along the propagating beam and can be varied their beam undulation by the applied voltage and the polarization of light beam. The breathing period can be adjusted by a periodic refractive-index modulation which is induced by a spatially periodic electric-field distribution. The dependence of breathing period on the polarization of the light beam is also discussed.