

# On the origin of the optical vortex lattices in a nematic liquid crystal light valve

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Optical vortices and lattices of these are attracting the attention of the scientific community because of their applications in various fields of optical processing, communications, enhanced imaging systems, and bio-inspired devices. Programmable optical vortices lattices with arbitrary distributions have been achieved using illuminated liquid crystals with photosensitive walls. Using an amplitude equation that describes these optical valves close to the Fréedericksz transition allows us to characterize analytically the vortices and the lattices they form. The numerical simulations of the amplitude equation, analytical solutions, and experimental observations show good agreement.