



Spin-to-orbital momentum conversion via electrooptic Pockels effect in crystals

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In the present work we have demonstrated a possibility for real-time operation by orbital angular momentum (OAM) of optical beams via Pockels effect in solid crystalline materials. Basing on the analysis of optical Fresnel ellipsoid perturbed by conically shaped electric field, we have shown that the point groups of crystals convenient for the conversion of spin angular momentum (SAM) to OAM should contain a three-fold symmetry axis or a six-fold inversion axis. The results of our experimental studies and theoretical simulations of the SAM-to-OAM conversion efficiency carried out for LiNbO₃ crystals agree well with each other.

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