Optimization of Electrooptic Sampling by Volume-Integral Method

A rigorous treatment of the influence of an inhomogeneous electric field on the differential polarization of an optical field, and the corresponding change in transmission of a retarder setup is presented. The method yields sensitivity coefficients employed directly in a volume-integral. In case of an external electrooptic probe tip a layered structure with a space-harmonic potential and a Gaussian sampling beam is investigated and results on sensitivity and spatial resolution are presented. The probing of inhomogeneous longitudinal and transverse fields with the same setup is demonstrated for a microstrip transmission line.

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