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**Optical Response of a Nematic Sample Submitted To a Periodic External Electric Field: Role of the Ionic Impurities** LAURA OLIVIA PALOMARES, JUAN ADRIAN REYES, Instituto de Fisica. Universidad Nacional Autonoma de Mexico. Apartado Postal 20-364, C. P. 01000, Mexico., GIOVANNI BARBERO, Dipartimento di fisica del politecnico e I. N. F. M., Corso Duca degli Abruzzi, 24 - 10129 Torino, Italy., FISICA TEAM — The influence of the ions dissolved in a nematic liquid crystals on the optical response of a nematic sample submitted to a periodic square wave is investigated. We show that according to the density of ions and of the properties of the dielectric layer deposited on the electrodes to avoid charge injection, different regimes for the optical phase difference are found. The role of the mobility of the ions on the phenomenon is investigated. We evaluate the surface density of adsorbed ions, by assuming a simple expression for the kinetic equation at the limiting surface. We suppose that the diffusion current is negligible with respect to the drift current. In this framework, the electrical problem relevant to the back electric field due to the redistribution of the ions is solved analytically. The adsorption problem is analyzed in the Langmuir approximation of low coverage of adsorbed particles. A possible extension of the model of Langmuir is also proposed.

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