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In-plane optical anisotropy in $In_xGa_{1-x}N/GaN$ multiple quantum wells induced by Pockels effect HSIU-JU CHANG, C. H. CHEN, L. Y. HUANG, Y. F. CHEN, Department of Physics National Taiwan University, Taipei, Taiwan, Republic of China, T. Y. LIN, Institute of Optoelectronic Sciences National Taiwan Ocean University, Keelung, Taiwan, Republic of China — We have investigated the crystal orientation dependence of optical properties in $In_XGa_{1-X}N/GaN$ multiple quantum wells. The spectral peaks and intensity of the micro- photoluminescence signal for different crystal orientations were found to have sixfold symmetry. Quite interestingly, the refractive index, obtained from the interference pattern, also varies with the crystal orientation. The 60 degree periodic anisotropy of electronic transitions as well as optical parameters was interpreted in terms of the Pockels effect induced by the strong built-in field in nitride heterojunctions. The linear dependence of the change of the refractive index on electric field is consistent with the prediction of the Pockels effect. Our result provides an alternative solution to improve the designs of photonic and electronic devices based on nitride semiconductors.

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