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Optical trends in InP polytypic superlattices¹ GUILHERME SIPAHI, TIAGO DE CAMPOS, PAULO EDUARDO DE FARIA JUNIOR, Universidade de São Paulo, State University of New York at Buffalo — Recent advances in growth techniques have allowed the fabrication of semiconductor nanostructures with mixed wurtzite/zinc-blende crystal phases. Although the optical characterization of these polytypic structures is well reported in the literature, a deeper theoretical understanding of how crystal phase mixing and quantum confinement change the output linear light polarization is still needed. Here, we theoretically investigate the effects of these polytypic homojunctions on the interband absorption of an InP superlattice [1]. Using a single 8×8 k.p Hamiltonian that describes both crystal phases [1,2] together with the effects of quantum and optical confinement we were able to explain the recent optical experimental results carried on polytypic InP [3]. In summary, we have shown how the interplay of crystal phase mixing and quantum confinement can be used for light polarization engineering in polytypic homojunctions.

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