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Wurtzite Effects on Spin Splitting of GaN¹ WAN-TSANG WANG, M.H. GAU, IKAI LO, S.F. TSAY, J.K. TSAI, K.L. HSIEH, J.C. CHIANG, Department of Physisc, Center for Nanoscience and Nanotechnology, National Sun Yat-Sen University, Kaohsiung, Taiwan, Republic of China — We report the theoretical study of the wurtzite effects on spin-splitting of GaN within a third-neighbor Linear Combination of Atomic Orbitals (LCAO) model. For wurtzite structure, there are two intrinsic wurtzite effects which are band-folding effect and structure inversion asymmetry. The band-folding effect generates two conduction bands (Δ_{C1} and Δ_{C3}), in which the p -wave probability and, consequently, the spin-splitting energy have abrupt changes when k_z increases toward the anti-crossing zone. The wurtzite effects, in addition to Rashba and Dresselhaus effect, give significant contributions to the large spin-splitting in GaN/AlN quantum wells.

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