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Spin splitting of the valence band Landau levels in GaAs quantum wells I. KHAN, T. ALI, M. YASAR, A. PETROU, SUNY at Buffalo, Buffalo NY, A. HANBICKI, G. KIOSEOGLOU, C. LI, B. JONKER, Naval Research Laboratory, Washington D.C. — We have studied as function of magnetic field the electroluminescence spectra from an n-i-p LED that incorporates three GaAs quantum wells in the intrinsic region. This device has excess n-type doping and as a result, the quantum wells are populated by a two-dimensional electron gas. The broad zero field emission band evolves into a series of discrete features in the presence of a magnetic field. These are identified as interband transitions between the $\ell = 0$, 1, and 2 Landau levels associated with the e_1 and h_1 subbands, with the selection rule $\Delta\ell = 0$. The EL spectra were analyzed in their σ+(LCP) and σ- (RCP) components. An energy splitting between the two polarized components is observed for each Landau level transition, which is equal to the sum of the conduction and valence band spin splittings. Since the electron g-factor value is known (g = - 0.44) we were able to determine the valence band spin splittings. Our experimental values are compared to calculated values (1) and were found to be in reasonable agreement. Work at SUNY was supported by ONR and NSF 1. H.A. Nickel et al., Phys. Rev. B, 62, 2773, (2000)

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