Zeeman splitting of electron spectrum in HgTe quantum wells near the Dirac point

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The Zeeman splitting of the conduction band in the HgTe quantum wells both with normal and inverted spectrum has been studied experimentally in a wide electron density range. The simultaneous analysis of the Shubnikov-de Haas oscillations in low magnetic fields at different tilt angles and of the shape of the oscillations in moderate magnetic fields gives a possibility to find the ratio of the Zeeman splitting to the orbital one and anisotropy of g-factor. It is shown that the ratios of the Zeeman splitting to the orbital one are close to each other for both types of structures, with a normal and inverted spectrum and they are close enough to the values calculated within kP method. In contrast, the values of g-factor anisotropy in the structures with normal and inverted spectra are strongly different and for both cases differ significantly from the calculated ones. We assume that such disagreement with calculations is a result of the interface inversion asymmetry in the HgTe quantum well, which is not taken into account in the kP calculations.

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