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Electron spin resonance in semiconductors

Zbysław Wilamowski, Agnieszka Wołoś, Hanka Przybylińska

We present a review of possible applications of magnetic resonances in semiconductors. The Electron Spin Resonance (ESR) technique has been applied to investigations of free and bound electrons in classical 2D and 3D semiconductors as well as paramagnetic centers in diluted magnetic semiconductors (DMS). We demonstrate that the spin orbit coupling (Rashba coupling) determines both the anisotropy of the g-factor and the resonance line broadening, leading to specific effects, such as a tuning of the resonance field by electric current or excitation of ESR by *rf* electric field. In DMS Korringa broadening, Knight shift and giant spin splitting are discussed. In magnetically ordered materials the resonance method allows detailed evaluation of magnetic anisotropy, as demonstrated in case of ferromagnetic bulk (Ga,Mn)As and magnetic precipitates in (Ga,Fe)N.