

Magnetic circular dichroism in ferromagnetic semiconductors

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Recent advances in the field of carrier-controlled ferromagnetism in tetrahedrally coordinated III-V and II-VI diluted magnetic semiconductors and their nanostructures will be reviewed with a focus on optical properties of these systems. Experimental results for (III,Mn)V materials, where the Mn atoms introduce both spins and holes, will be compared to the case of (II,Mn)VI compounds, where extrinsic doping is necessary to observe a ferromagnetic behaviour. It will be argued that an anomalous sign of magnetic circular dichroism in these systems results from high hole densities and the associated Moss-Burstein shift. A contribution of intra and inter valence-band transitions to optical response of these systems will be demonstrated. Finally, an important question of isothermal magnetization manipulation by light will be addressed.

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