Floquet engineering of structures based on gapless semiconductors

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Applying the conventional Floquet theory of periodically driven quantum systems, we developed the theory of optical control of structures based on gapless semiconductors. It is demonstrated that electronic properties of the structures crucially depends on irradiation. Particularly, irradiation by a circularly polarized electromagnetic wave lifts spin degeneracy of electronic bands and induces surface electronic states. Thus, a high-frequency off-resonant electromagnetic field can serve as an effective tool to control electronic characteristics of the structures and be potentially exploited in optoelectronic applications of them.

Keywords: Floquet systems, gapless semiconductors.

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