

**SPIN POLARIZATION OF ELECTRONS BY MEANS OF QUANTUM
RING WITH RASHBA INTERACTION IN THE REGIME OF STRONG
LIGHT-MATTER COUPLING**

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Electronic properties of semiconductor quantum rings with the Rashba spin-orbit interaction irradiated by an off-resonant high-frequency electromagnetic field (dressing field) in the presence of the perpendicular magnetic field are analysed [1]. Within the Floquet theory [2] of periodically driven quantum systems, it is demonstrated that the dressing field drastically modifies all electronic characteristics of the rings, including spin-orbit coupling, effective electron mass, and optical response. The specific conditions have been found that allow to control the spin polarization of electrons in prospective ring-shaped spintronic devices.

References

- [1] M. Pudlak, R. Nazmitdinov, *Spin Interference Effects in a Ring with Rashba Spin-Orbit Interaction Subject to Strong Light-Matter Coupling in Magnetic Field*, *Symmetry*, **14**, 1194 (2022).
- [2] A. Eckardt, E. Anisimovas, *High-frequency approximation for periodically driven quantum systems from a Floquet-space perspective*, *New J. Phys.*, **17**, 093039 (2015).