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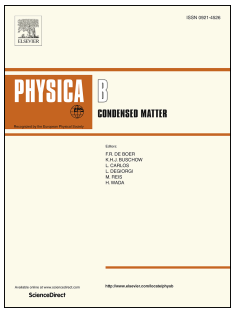

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The Rashba and Dresselhaus spin-orbit interactions effects on the optical properties of a quantum ring

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Abstract

Influence of Rashba and Dresselhaus spin orbit interactions (SOIs) as well as external magnetic and electric fields on optical behaviors of quantum rings (QRs) were studied. To achieve this purpose, the matrix diagonalization method was exerted to compute energy eigenvalues of the system in the presence of electric and magnetic fields. Besides,the compact density matrix approach was used to calculate the refractive index (RI) and absorption coefficient (AC) of $1 \longrightarrow 2$, $1 \longrightarrow 3$, $1 \longrightarrow 6$ and $3 \longrightarrow 5$ transitions. Moreover, by increasing the magnetic (B) and electric (F) fields, energy splitting of intersubband energy levels was increased and thus the RIs and ACs of the system are changed. The results clearly show that, position and peak value of total RIs and ACs curves of all transitions experienced significant change

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