

Abstract Submitted  
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**Electron exchange between quantum dot and ring by jumping in magnetic field** IGOR FILIKHIN, SERGEI MATINYAN, JAMES NIMMO, BRANISLAV VLAHOVIC, North Carolina Central University — Semiconductor heterostructures as quantum dots (QD) or quantum rings (QR) demonstrate discreet atom-like energy level configuration. In the presented work we show that in the weak coupled Double Concentric Quantum Ring (DCQR) electron position jumping can exist due to the energy level crossing. We study DCQR composed of GaAs in an  $\text{Al}_{0.70}\text{Ga}_{0.30}\text{As}$  substrate under influence of magnetic field. In our model the DCQR is considered in three dimensional space within single sub-band effective mass approach [1]. Magnetic field is applied in  $z$  direction, perpendicular to the DCQR plane. The electron position in DCQR is defined by effective radius which is radius of most probable localization of a single electron. We study electron structure of QD located at the center of QR. The electron position jumping between QD and QR is considered. Discussed will be possibility of experimental implementations of the jumping effect for composite object of QD and QR.

[1] I. Filikhin, V. M. Suslov and B. Vlahovic, Phys. Rev. B 73, 205332 (2006).

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