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Electron energy spectra in two dimensional quantum rings consisting of two nanoelements AVAG SAHAKYAN, RUZAN MOVSESYAN, The State Engineering University of Armenia, ARMEN KOCHARIAN, California State University, Los Angeles — Electron spectrum and ground state properties in two dimensional confined quantum rings with $R_{1,2}$ radiuses consisting of the two different (materials) nanoelements divided by two sectored finite size quantum wells with various potentials and spanning angles, is studied in the presence of transverse magnetic field. The calculated wave function shows oscillations along the radial direction which are progressing by approaching to the internal radius of the ring, R_2. Situation here is similar to the problem of fall of the particle on the attractive center. However, these oscillations are interrupted on the internal ring boundary by providing the new ground state which is sensitive to the change of magnetic flux. For shallow energy levels some energy states are undergoing changes controlled by magnetic field accompanied with the persistent current and abrupt phase transitions. Magnetization and magnetic susceptibility show characteristic two dimensional anomalous behaviors different from one found in one dimensional ring.

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