



Contribution ID: 26

Type: not specified

Vacuum currents in braneworlds with compact dimensions

Tuesday, 17 September 2019 11:55 (35 minutes)

We investigate the vacuum expectation value (VEV) of the current density for charged quantum fields in background of locally AdS spacetime with an arbitrary number of toroidally compact dimensions and in the presence of a constant gauge field. Along compact dimensions the field operator obeys quasiperiodicity conditions with arbitrary phases. The VEVs for the charge density and the components of the current density along uncompact dimensions vanish. The components along compact dimensions are decomposed into the brane-free and brane-induced contributions. The behavior of the vacuum currents in various asymptotic regions of the parameters is investigated. Applications are given to braneworld models of the Randall-Sundrum type with compact dimensions. In the special case of three-dimensional spacetime, the corresponding results are applied for the investigation of the edge effects on the ground state current density induced in curved graphene tubes by an enclosed magnetic flux.

Primary author: BELLUCCI, Stefano (Istituto Nazionale Fisica Nucleare (IT))

Presenter: BELLUCCI, Stefano (Istituto Nazionale Fisica Nucleare (IT))