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Generalization of lattice Dirac operator index

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By employing K-theory to classify the Wilson Dirac operator on a lattice, we give a comprehensive formulation for various indices via its spectral flow. While the index of the overlap Dirac operator, which utilizes the Ginsparg-Wilson relation, is limited to flat tori in even dimensions, our formulation offers several key advantages: 1) It is straightforward to apply to the Atiyah-Patodi-Singer index for manifolds with boundaries. 2) The boundary can be curved, allowing for the inclusion of gravitational effects. 3) The mod-2 index in even and odd dimensions can be defined as a natural extension. In the talk, we describe its mathematical proof and give some numerical examples.

Parallel Session (for talks only)

Theoretical developments and applications beyond Standard Model

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