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Lifshitz Josephson Junction

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Scaling symmetry of space time plays important role in many physical phenomena. For example, the CMB spectrum of cosmology and critical phenomena in condensed matter physics are governed by scaling symmetry. In this project, we consider anisotropic scaling symmetry in non-relativistic system and study its effect on quantum mechanics. As an example, we consider an anisotropic Josephson junction and show that its efficiency can be greatly enhanced by tuning the degree of anisotropy. Such anisotropic Josephson junction can be realized with a special form of lattice, which is realizable with the help of modern computational materials science.

Primary author: GUNAWAN, Alfian (National Tsing Hua University)

Co-author: CHU, Chong-Sun (National Tsing-Hua University)

Presenter: GUNAWAN, Alfian (National Tsing Hua University)

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