2007 Vol.47 No.4 pp.669-671 DOI:

Appearance of Spatial-Temporal Noise in Super-conducting Junction and Its Effect on Transport of Electron Pairs

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(Received: 2006-8-9; Revised:)

Abstract: Transport of electron pairs in super-conducting junction with spatial-temporal noise is investigated. We show that the spatial-temporal noise can produce the current of the electron pairs, which stems from a symmetry breaking of the system induced by the correlation of the spatial-temporal noise with the phase difference. It is found that there is a positive current for the electron pairs, exhibiting a peak with increasing the values of some parameters of the noises. The results provide a theoretical foundation for the further investigation of the super-conducting junction.

PACS: 05.40.-a

Key words: super-conducting junction, electron pairs, spatial-temporal noise

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