

Influence of stationary charge imbalance on Shapiro step features

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The nonequilibrium phenomena in the coupled system of Josephson junctions, taking into account the charge imbalance of the elementary excitations spectrum branches has been studied. We investigate the influence of stationary charge imbalance on the Shapiro step properties on the current-voltage characteristics of coupled system of Josephson junctions. It has been found that Shapiro step demonstrates a shift and a slope with respect to its original position, determined by $V=N\omega$. The value of the slope increases with increasing in nonequilibrium parameter. The shift appears due to nonperiodic boundary conditions and its value increase under the influence of stationary charge imbalance in the system. Obtained results are in good agreement with a results published in ref.[1,2,3].

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