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Influence of Radiation on the Chaos in a Coupled System of Josephson Junctions with Large Dissipation

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The arrays of Josephson junctions are an intensively studied topic with a large range of applications in metrology, detectors and radiation emission, and have promising application in quantum computing. The main way to study arrays of Josephson junctions is to investigate their current voltage characteristics and generation of charge oscillations of the Josephson plasma.

In previous work [1] was shown the existence of the second hysteresis zone on the I-V characteristic for large values of coupling and dissipation parameters in arrays of Josephson junctions (JJs). Furthermore, was observed the chaotic phenomena at transition to the collective state for corresponding values of coupling and dissipation parameters [2].

In this work was studied the possibility of suppression of chaotic phenomena in stacks of Josephson junctions. Were realized numerical simulations using CCJJ+DC of exposed to radiation chaotic states of the system. Were varied frequencies and amplitudes of the radiation. Was studied the optimal way for chaos suppression and discussed the possible applications of the discovered phenomena.

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[1] A. Zubarev, M.Cuzminschi, Yu. M. Shukrinov; Influence of dissipation and coupling on collective behavior in systems of Josephson Junctions, international symposium "Nanophysics & Nanoelectronics", Nizhny Novgorod, Rusia March, 13-16, 2017; t 1, p 19

[2] M.Cuzminschi, A. Zubarev, Yu. M. Shukrinov Influence of Radiation on the Chaos in a Coupled System of Josephson Junctions with Large Dissipation, international symposium "Nanophysics & Nanoelectronics", Nizhny Novgorod, Rusia March, 13-16, 2017; t 1, p 9

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