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Resonance effects in coupled Josephson junctions with LCR-shunting

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Abstract content
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One of the important problems on the way of using the intrinsic Josephson junctions in HTSC as terahertz lectromagnetic waves sources¹ is a synchronization of all junctions in a stack to increase a power of radiation. An intensive attempts to solve this problem are based on using LC-shunting which leads to such synchronization ^{2,3}.
We examine the effect of LC shunting on the phase dynamics of Josephson junction. It has been shown that additional (rc) branches appear in the current–voltage characteristics of the junctions when the Josephson frequency is equal to the natural frequency of the formed resonance circuit (rc-frequency) ⁴. The effect of the parameters of the system on its characteristics has been studied. The double resonance has been revealed in the system when the Josephson frequency is equal to the rc-frequency and double frequency of a longitudinal plasma wave appearing under the parametric resonance conditions. We study the effect of electromagnetic radiation on the parameters of the system ⁵. The double resonance has been revealed in the system when the frequency of radiation is equal to the Josephson frequency and the rc-requency. Triplet resonance has been investigated in the system when the external frequency of microwave irradiation coincides with the rc-frequency, the Josephson frequency, frequency of a longitudinal plasma wave.

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MSc

Main supervisor (name and email)
and his / her institution

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Would you like to <br> submit a short paper <br> for the Conference
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yes

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