

## **Frequency Locking in System of Overdamped Josephson Junctions Shunted by LC-circuit**

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An interesting problem concerns the effect of electromagnetic radiation on a system of coupled Josephson junctions shunted by LC-elements. Without shunting external radiation produces an additional superconducting current. It leads to the appearance of the Shapiro steps and their subharmonics in the IV-characteristics, which position and width depend on radiation frequency and amplitude. Shunting of the system by LC-elements leads to a crucially changes in the properties of the Shapiro step when it is on the parallel resonant branch [1, 2, 3]. The properties of the Shapiro steps in the shunted Josephson junction are not investigated enough yet.

We study the influence of the external electromagnetic radiation on the phase dynamics of the system of coupled Josephson junction shunted by LC-elements. We simulate the IV-characteristics and the amplitude dependence of Shapiro step width. The changes on the amplitude dependence of step width when the step is on a serial resonant branch are shown. We investigate the influence of external radiation on the time dependence of voltage and charge in the resonant area.

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