

Josephson Junction with Two Superconducting Current Components

The properties of a Josephson junction with the 2π - and 4π -periodic superconducting current component have been analyzed. It exhibits the 4π periodicity of the phase difference in the range of low voltages for the Majorana current amplitude much smaller than the Josephson current which makes it possible to observe Josephson current oscillations with a fractional period for small dissipation $\beta < 1$ in the hysteresis region. The effect of 4π -periodic Majorana current component is also manifested itself of the current-voltage characteristic as an additional sequence of the Shapiro steps in the staircase structure. We have determined the interval of external electromagnetic radiation amplitudes, in which the manifestation of the fractional Josephson effect on the current-voltage characteristic is the most significant.

Primary authors: Prof. NAKHMEDOV, Enver (Baku Branch, Moscow State University, Baku, AZ1144 Azerbaijan); Mr KULIKOV, Kirill (RF); Dr DAWOOD, Radva (University of Cairo, Cairo, Egypt); Prof. SHUKRINOV, Yury (JINR, BLTP)

Presenter: Mr KULIKOV, Kirill (RF)

Track Classification: Theoretical Physics