Coexistence of 0- and pi-states in Josephson SFS junctions

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Abstract. Use of a modern "trilayer technology" of SFS junction fabrication allows us to increase the junction critical current density in the pi-state up to 10^{4} A/cm^2. The 0-pi transition for Nb-CuNi-Nb junctions occurs at small enough thickness of ferromacnetic CuNi layer (about 7 nm) that occasions the persistence of the second (2\phi) component of the current phase relation. Half-integer Shapiro steps and half-flux-quantum period of Fraunhofer pattern are clear evidences of the 2\phi component supercurrent flow observed at 0-pi transition temperature.