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Title:The Shapiro steps revealed by Josephson junctions embedded in silicon microcavities
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Abstract:One of the best candidate on the role of the THz optoelectronic pairs appears to be the high mobility p-type silicon quantum well (Si-QW), 2 nm, confined by the δ-barriers heavily doped with boron on the n-type Si (100) surface. The δ-barriers heavily doped with boron are already shown to exhibit the high temperature superconductor properties, T_c = 145 K, 2Δ = 44 meV and H_{c2} = 0.22 T. This Si-QW confined by the superconductor δ-barriers is a basis of the sandwich nanostructure device that is used to register the Shapiro steps and the Fiske steps by measuring the Josephson CV characteristics. The Josephson GHz and THz emission is controlled, for the first time, by stabilizing the drain-source current and by varying the top gate voltage. © 2012 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim.
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Inspec controlled terms:boron - elemental semiconductors - heavily doped semiconductors - high-temperature superconductors - Josephson effect - microcavities - semiconductor quantum wells - silicon - superconducting semiconductors - terahertz wave generation
Uncontrolled terms:Shapiro steps - Josephson junctions - silicon microcavities - THz optoelectronics - high mobility p-type silicon quantum well - n-type Si (100) surface - heavily doped δ-barriers - high temperature superconductor - sandwich nanostructure device - Si:B - size 2 nm - top gate voltage - drain-source current - Josephson THz emission - Josephson GHz emission - Josephson CV characteristics - Fiske steps
Inspec classification codes:A7450 Superconductor tunnelling phenomena, proximity effects, and Josephson effect - A7470V Perovskite phase superconductors - A7430F Transport properties of superconductors
Numerical data indexing:size 2.0E-09 m
Chemical indexing:Si:B/int Si/int B/int Si:B/bin Si/bin B/bin Si/el B/el B/dop
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