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# Millimeter-Wave Mixing with Josephson Junctions

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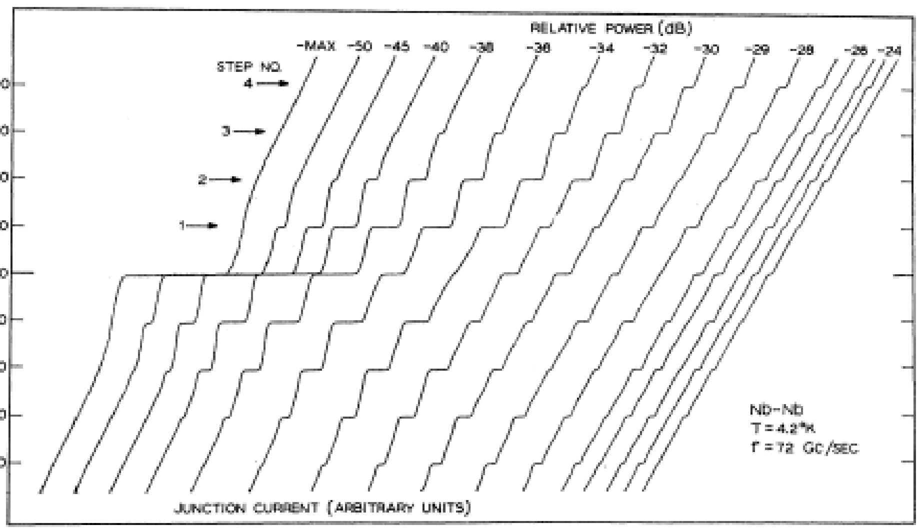


Fig. 1. Voltage-current curves for a Nb-Nb point-contact Josephson junction exposed to a 72-Gc/sec signal at various power levels.

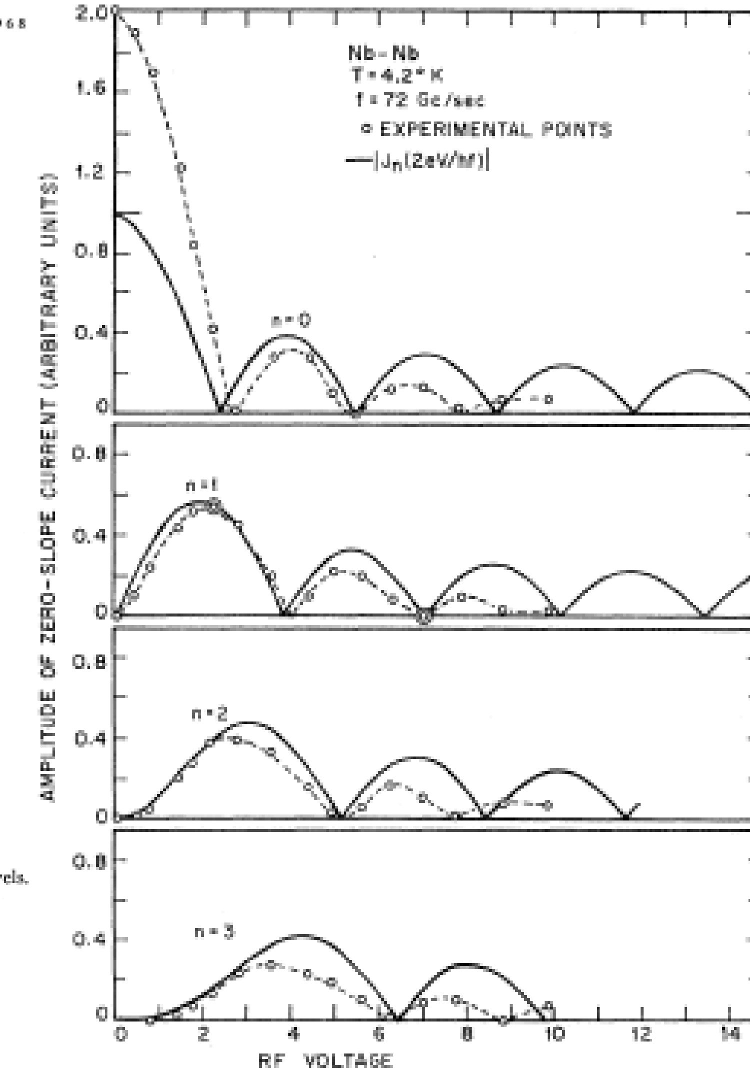


Fig. 2. Data from Fig. 1 plotted to display how the current in several constant-voltage steps varies as the applied rf voltage is varied. The data points from the $n$th step are compared with the amplitude of the $n$th-order Bessel function which is the behavior expected for an ideal tunnel junction. The data were fitted to the theoretical curves at the two points denoted by double circles. The rf voltage across the junction is expressed in units of $hf/2e$ or 149 $\mu$V per division.

# Effect of Microwaves on Josephson Currents in Superconducting Tunneling*

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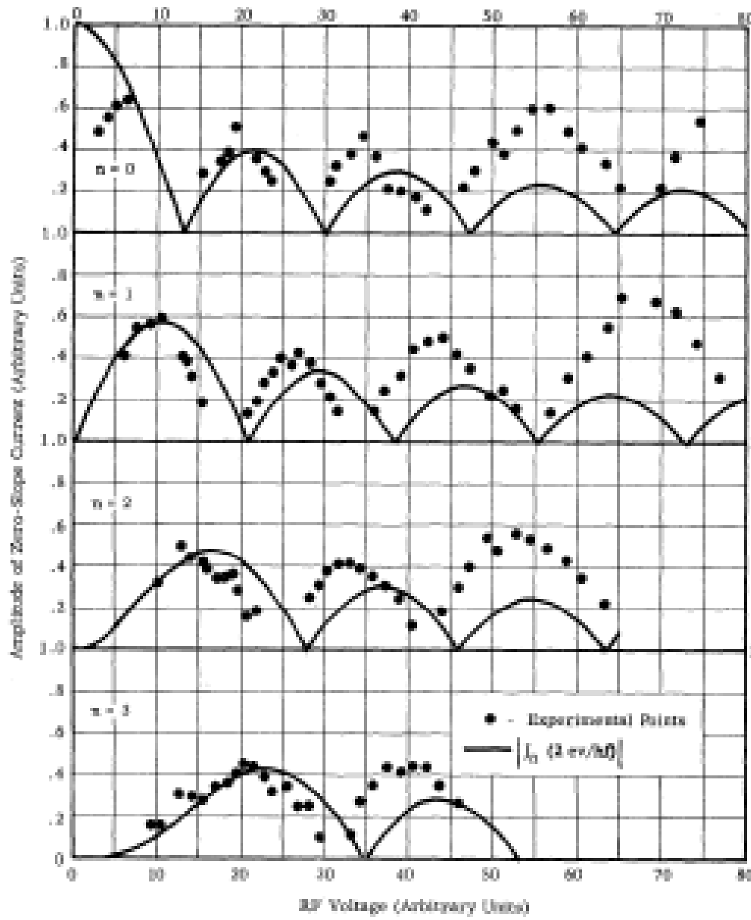


Fig. 3. The amplitude of zero-slope current at zero voltage and at the first three steps in voltage ($n = 0,1,2,$ and 3) plotted as a function of rf voltage amplitude across the tunneling sample. Also shown (solid line) is the magnitude of the corresponding Bessel function, $J_n\,(2ev/hf)$.