430. Title:Influence of thermal noise on terahertz-wave radiation from intrinsic Josephson junctions

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Abstract:Numerical simulations using the coupled sine-Gordon equations taking thermal noise into account were performed in order to investigate the influence of thermal fluctuations on the spectra of terahertz waves radiated from current-biased intrinsic Josephson junctions. Under the thermal fluctuations, the power spectra exhibited a main peak and several harmonics at the maximum radiation power. The thermal noise current In broadened these peaks, and the high harmonic peaks vanished due to the increase in noise levels. For a two-junction stack, the normalized line width Δf/f 0 in the power spectra varied from 0.11% to 0.27% with increasing In . For a 10-junction stack, the line width of 0.06% was obtained by modifying an autocorrelation function of In . These results are useful for line width experiments to investigate terahertz waves emitted by Bi2Sr2CaCu2O8+ x intrinsic Josephson junctions.