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Hot Spots and THz Waves in $Bi_2Sr_2CaCu_2O_8$ Intrinsic Josephson Junction Stacks: Recent Developments

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Stacks of intrinsic Josephson junctions made of the high temperature superconductor $Bi_2Sr_2CaCu_2O_8$ [1] emit coherent radiation at THz frequencies [2,3]. Emission can occur at relatively low bias but also at large input power. At high bias a hot spot forms [4], affecting both the intensity and the linewidth of THz radiation [5]. Despite of several years of research the mechanism of synchronizing the junctions in the stack and the relation of hotspots and THz emission is still under debate [6]. We investigated THz emission and hotspot formation using a combination of transport measurements, electromagnetic wave detection via a superconducting receiver and low temperature scanning laser microscopy [3,4,5]. In this talk recent experimental results of our collaboration will be presented and compared to numerical simulations.

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