TOWARDS TERAHERTZ JOSEPHSON RADIATION SOURCES: RECENT RESULTS

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In the talk recent results of our work towards continues wave teraherz radiation sources based on arrays of discrete Josephson junctions will be summarized. Self-radiation from arrays of low-temperature [1] and high-temperature superconductor junctions [2], embedded in an open quasioptical resonator will be discussed. We have explored the millimeter wave radiation from our Josephson junction arrays embedded in a quasioptical resonator. Radiation from arrays was detected by a low noise superheterodyne receiver at frequency about 80 GHz and liquid nitrogen and helium temperatures. Also the new results of the measurements with broadband detectors [3] will be presented. To explain the coherent behavior of the array of Josephson junctions electromagnetic field simulations were performed. Considering the substrate as a dielectric resonator antenna, the coherent emission was excited if the location of each subarray coincided with the positions of the maximum electric field intensity in the substrate resonance mode. The linewidth of the self-radiation, microwave coupling and impedance matching with a quasioptical resonator will be discussed at the Conference.

References

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