

Development of a Desktop Josephson Voltage Standard System with a Compact Refrigerator

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A prototype of a desktop Josephson voltage standard system with a compact refrigerator has been developed. The performance of the prototype system was evaluated by measuring current-voltage (I - V) characteristics for NbN/TiNx/NbN junction arrays cooled in the system supplied with a microwave (16 GHz). As a result, constant-voltage steps with amplitudes greater than 1 mA were observed on the I - V characteristics, indicating that the system was normally operated. The highest output voltage for the developed system is 1 V. We have a plan to increase it up to 10 V in near future.

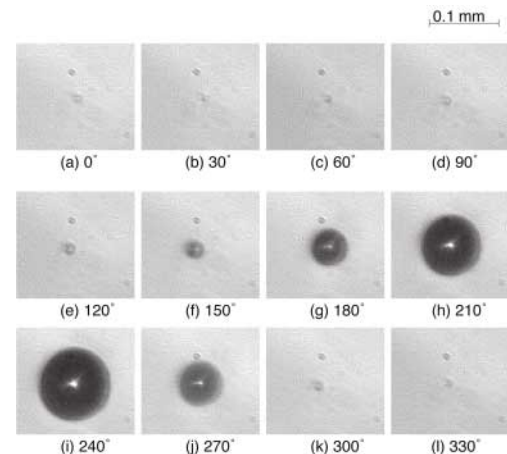


A photograph of a desktop Josephson voltage standard system

Observation of a Cavitation Bubble

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A sonoluminescing single-bubble was illuminated using a stroboscope and its shadow images were captured with a synchronized CCD camera. Although it is possible to measure the bubble size using a light-scattering method with a photomultiplier tube (PMT), it is rather troublesome to arrange the optical axis precisely. The author suggests a new method that the optical system consists of a beam splitter inserted between a lens and the CCD camera, and a PMT mounted at the beam splitter. It is confirmed that this system is useful for the simultaneous observation of the bubble size, shape and translational motion.



The direct image of the bubble obtained by changing the phase of flash timing