Abstracts

Space-based high-temperature superconductivity experiment-design and performance

E. Polturak, G. Koren, I. Flohr, R. Waller and M. Guelman. "Space-based high-temperature superconductivity experiment-design and performance." 2000 Transactions on Microwave Theory and Techniques 48.7 (Jul. 2000, Part II [T-MTT] (Special Issue on Microwave and Communication Applications at Low Temperature)): 1289-1291.

In this paper, we describe the first successful superconductivity experiment in space. The experiment aims to test the long-term survivability of high-temperature superconductors (HTSs) under space conditions. Our system consists of a thin YBa/sub 2/Cu/sub 3/O/sub 7/ film integrated with a cryocooler. The experiment orbits the Earth aboard the TECHSAT II satellite as of July 1998. Periodic testing of the device returns data on its resistance, critical temperature, and critical current. As of now, the superconducting film has shown a marginal degradation of its properties. We hope to provide the basic long-term survivability data needed to advance applications of HTSs in space-based communication systems.

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