

Niobium SupraMEMS for Reconfigurable Millimeter Wave Filters

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Reconfigurable passive superconducting devices for the mm-wave regime offer a wide range of novel applications in scientific and industrial remote sensing. We developed a surface mounted Niobium MEMS technology that can be integrated with a wide range of cryogenic semiconductor and superconducting circuits. A first generation of circuits using our Niobium SupraMEMS has been optimized for radio astronomical applications. In this paper we present the micro-mechanical and electrical characterization of the devices. Extended mechanical modeling results in an improved understanding of the specific behavior of metallic cryogenic MEMS devices. The influence of the fabrication procedure on the mechanical properties of the devices and the resulting limitations are discussed. A particular design for improved tuning range has been investigated.

