Abstracts

Dynamic Range Considerations for High-Temperature Superconducting Filter Applications to Receiver Front-Ends

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Planar thin-film high-temperature superconducting (HTS) filters offer very low loss and, when muitiplexed into filterbanks, the potential for smaller volume than conventional technology filters of comparable performance. In this paper the issues concerning the application of HTS filters to preselection in microwave receiver front ends will be addressed. These issues include noise figure, third order intermodulation distortion and spur-free dynamic range. The reasons to evaluate HTS filters for these applications are: 1) HTS filters contribute negligible system noise figure because they not only have low loss but operate around 77K and 2) they are nonlinear devices. Our measurements and calculations show that HTS filters in the front end of microwave receivers will allow all the advantages of preselection without contributing significantly to the system noise figure. On the other hand, even though HTS filters are nonlinear, the upper end of the dynamic range will most likely be set by the rest of the receiver chain, not by the HTS preselector.

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