

## **A 5-JUNCTION ARRAY SIS MIXER FOR VERY WIDE BAND HETERODYNE SUBMILLIMETER-WAVE SPECTROMETRY**

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The study of submillimeter-wave radiation in astronomy and atmospheric sciences requires increasingly performant receivers, in particular allowing extended spectral line surveys. To this end, we are developing a quantum-noise limited heterodyne receiver based on SIS junction parallel arrays with broad (larger than 30%) fixed tuned bandwidth. Simulations show that networks of junctions ( $N > 2$ ) of micronic size, embedded in a superconducting microstrip line, can provide a bandwidth in excess of the ultimate limit for a single device. These circuits can be viewed as passband filters which have been optimized by varying the spacings between junctions. We present here the design of a 5-Nb/AlOx/Nb junction array mixer, the fabrication process, and the Fourier Transform Spectroscopy and heterodyne measurements of the first arrays made in Paris Observatory, to operate around 500-600 GHz.

The influence of the Josephson effect in these devices will also be discussed.