364
Accession number:20125115817528
Title:Development of superconducting spectroscopic array receiver: A multibeam 2SB SIS receiver for millimeter-wave radio astronomy
Authors:Shan, Wenlei (1); Yang, Ji (1); Shi, Shengcai (1); Yao, Qijun (1); Zuo, Yingxi (1); Lin, Zhenhui (1); Chen, Shanhuai (1); Zhang, Xuguo (1); Duan, Wenying (1); Cao, Aiqing (1); Li, Sheng (1); Li, Zhenqiang (1); Liu, Jie (1); Zhong, Jiaqiang (1)
Author affiliation:(1) Purple Mountain Observatory, Chinese Academy of Sciences, Nanjing 210008, China; (2) Tongji University, Shanghai 200092, China
Corresponding author:Yang, J.(jiyang@pmo.ac.cn)
Source title:IEEE Transactions on Terahertz Science and Technology
Abbreviated source title:IEEE Trans. Terahertz Sci. Technolog.
Volume:2
Issue:6
Issue date:2012
Publication year:2012
Pages:593-604
Article number:6313968
Language:English
ISSN:2156342X
Document type:Journal article (JA)
Publisher:IEEE Microwave Theory and Techniques Society, 2458 East Kael Circle, Mesa, AZ 85213, United States
Abstract:We have developed a 3×3 multibeam sideband separation superconducting receiver-Superconducting Spectroscopic Array Receiver (SSAR)-for the 85-115 GHz frequency band. The receiver employs 2SB superconductor-insulator- superconductor (SIS) mixers with a typical single sideband (SSB) noise temperature of 60 K and image rejection ratio above 10 dB over the frequency band. Digital techniques are extensively applied in this receiver system for excellent operational stability and efficiency. They include fast Fourier spectrometers, digital LO and digital bias supplies. In our knowledge this is the first 2SB multibeam millimeter wavelength receiver in the world. This receiver has been successfully put into observation and its considerable enhancement of mapping speed has been demonstrated.]]> © 2011-2012 IEEE.
Number of references:43
Main heading:Superconductivity
Controlled terms:Frequency bands - Radio astronomy - Spectrometers
Uncontrolled terms:Array receiver - Digital techniques - Fourier spectrometer - Heterodyne instruments - Image rejection ratios - Imaging arrays - Low noise - Millimeter wavelength - Millimeter-wave radio - Multibeams - Operational stability - Receiver system - Sideband separation - Single-sideband noise - SIS receivers
Classification code:701.1 Electricity: Basic Concepts and Phenomena - 716.3 Radio Systems and Equipment - 716.4 Television Systems and Equipment - 801 Chemistry
DOI:10.1109/TTHZ.2012.2213818
Database:Compendex
Compilation and indexing terms, Copyright 2012 Elsevier Inc.