

332

Accession number:20122915252094

Title:Development of kinetic inductance Stationary-Wave Integrated Fourier-Transform Spectrometry (SWIFTS)

Authors:Boudou, N. (1); Monfardini, A. (1); Hoffmann, C. (1); Calvo, M. (1); Podevin, F. (2); Xavier, P. (2)

Author affiliation:(1) Institut Nél, CNRS and Université Joseph Fourier, BP 166, 38042 Grenoble cedex 9, France; (2) IMEP-LAHC, Grenoble INP, Minatec, BP 257, 38016 Grenoble Cedex 1, France

Corresponding author:Boudou, N.(nicolas.boudou@grenoble.cnrs.fr)

Source title:Journal of Low Temperature Physics

Abbreviated source title:J. Low Temp. Phys.

Volume:167

Issue:3-4

Issue date:June 2012

Publication year:2012

Pages:386-391

Language:English

ISSN:00222291

E-ISSN:15737357

CODEN:JLTPAC

Document type:Conference article (CA)

Publisher:Springer New York, 233 Springer Street, New York, NY 10013-1578, United States

Abstract:We present millimeter-wave Stationary-Waves Integrated Fourier Transform Spectrometry (SWIFTS) using the nascent Kinetic Inductance Detector (KID) technology. SWIFTS operation consists in converting a stationary-wave spatial sampling into the frequency domain; our SWIFTS devices are designed to operate in the sub-THz region. Millimeter wave power is probed using KIDs, high-quality superconducting resonators deemed to be the next generation millimetric photon detectors for large array astronomy cameras. We expect KIDs to be sensitive enough to sense the stationary wave without altering its properties. Moreover, KID multiplexing capabilities will allow the use of many detectors on a single transmission line, facilitating cryogenic measurements. The SWIFTS concept, already validated in the optical and microwave (<20 GHz) bands, will be useful in any applications where integrated and broadband spectral analysis is needed. We discuss SWIFTS device structure, its measurement operation and some preliminary results. © Springer Science+Business Media, LLC 2012.

Number of references:11

Main heading:Kinetics

Controlled terms:Detectors - Frequency bands - Inductance - Integration - Millimeter waves - Spectrometry - Spectrum analysis

Uncontrolled terms:Device structures - Fourier transform spectrometers - Fourier transform spectrometry - Frequency domains - High quality - Kinetic inductance detectors - Kinetic inductances - Large arrays - Photon detector - Single transmission - Spatial sampling - Stationary waves

Classification code:943 Mechanical and Miscellaneous Measuring Instruments - 942 Electric and

Electronic Measuring Instruments - 941 Acoustical and Optical Measuring Instruments - 931
Classical Physics; Quantum Theory; Relativity - 921.2 Calculus - 944 Moisture, Pressure and
Temperature, and Radiation Measuring Instruments - 921 Mathematics - 801 Chemistry - 716.4
Television Systems and Equipment - 711 Electromagnetic Waves - 701.1 Electricity: Basic
Concepts and Phenomena - 914 Safety Engineering

DOI:10.1007/s10909-012-0464-3

Database:Compendex

Compilation and indexing terms, Copyright 2012 Elsevier Inc.