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2.6 SQUID current amplifier in the large-signal limit (dynamics)2.7 SQUID current amplifier at ultralow temperature; 2.8 SQUID voltage amplifier; 3 Energy Resolution (FWHM) of Superconducting Detectors; 3.1 Signal-to-noise ratio, equivalent noise charge and noise linewidth of spectrometers: General formulations; 3.2 Signal-to-noise ratio, ENC, energy resolution at FWHM of Tunnel Junctions; 3.3 Noise equivalent power, energy resolution of superconductor microcalorimeters; 3.4 Dynamics and noise of time-variant detector systems
3.5 Signal-to-noise ratio of detector arrays with multiplexed read-out4 Pulse Processing Electronics; 4.1 Pulse processing techniques; 4.2 Analogue-to-digital conversion; 4.3 Digital rise (fall) time discrimination; 4.4 Superconductor digital spectrometer; 4.5 Selected topics on the hardware design; 5 Applications of Systems Based on Superconducting Detectors; 5.1 Electron-Probe Nanoanalysis with Superconductor detectors; 5.2 Biopolymer mass spectrometer; 6 Selected Topics of Analysis and Synthesis of Detector Systems; 6.1 Analogue electronic circuitry analysis and design principles
6.2 Discrete-time systems and Systems with periodically changing parameters6.3 Inductance calculations of the superconducting structures; Index

Sommario/riassunto

With the commercialisation of superconducting particles and radiation detectors set to occur in the very near future, nuclear analytical instrumentation is taking a big step forward. These new detectors have a high degree of accuracy, stability and speed and are suitable for high-density multiplex integration in nuclear research laboratories and astrophysics. Furthermore, superconducting detectors can also be successfully applied to food safety, airport security systems, medical examinations, doping tests & forensic investigations.This book is the first to address a new generation of analy