

X-ray Spectrometer Design



Overview

This guide provides some simple and easy to use design guidelines and formulas for designing, evaluating and comparing various diode array, diffraction grating based spectrometers designs The input to the design process is the wavelength range you want to cover and the. This guide provides some simple and easy to use design guidelines and formulas for designing, evaluating and comparing various diode array, diffraction grating based spectrometers designs The input to the design process is the wavelength range you want to cover and the. This guide provides some simple and easy to use design guidelines and formulas for designing, evaluating and comparing various diode array, diffraction grating based spectrometers designs The input to the design process is the wavelength range you want to cover and the optical resolution by which. In this learning path, you will learn how to build a spectrometer. Spectroscopy is a non-invasive technique and one of the most powerful tools available to study tissues, plasmas and materials. You'll. Two extended x-ray absorption fine structure flat crystal x-ray spectrometers (EFX's) were designed and built for high-resolution x-ray spectroscopy over a large energy range with flexible, on-shot energy dispersion calibration capabilities. The EFX uses a flat silicon crystal in the. Here, we report on a non-destructive, tabletop approach that addresses this imaging problem through x-ray tomography, which we uniquely realize with an instrument that combines a scanning electron microscope (SEM) with a transition-edge sensor (TES) x-ray spectrometer. Our approach uses the highly. nement fusion (MCF) and high energy density physics (HEDP) experiments. Recent advances in spectrometer design have led to improve-ments in spe trometer capabilities, physical characteristics and calibration quality. Designed for hard X-ray photon-in/photon-out spectroscopy, the spectrometer achieves a resolution in the 0.

Article Content

Feb 21, 2026

JATIS-17057SSP 13..13

The SXS design derived considerable heritage from the design of the calorimeter-based x-ray spectrometer (XRS) of Suzaku and Astro-E, and the starting points for the ApA and BF design for

Nov 16, 2025

Highly efficient and aberration-free off-plane grating spectrometer and ...

In this work, we report a simple dual-optic imaging spectrometer-monochromator using a uniformly spaced flat grating in off-plane geometry with globally optimized spatio-temporal

May 06, 2026

A Wide-Range High-Resolution X-ray Crystal

Wide-range crystal spectrometers are important tools for performing X-ray spectroscopic measurements of medium- and high-Z tracer elements in

Oct 26, 2025

The X-ray spectrometer

In comparison, his father's laboratory in Leeds was far better equipped. Of major importance was WHB's design and the construction, in the winter of 1912 - 1913, in the physics workshop, by the head

Nov 28, 2025

X-ray spectroscopy

Characteristic X-ray spectroscopy When an electron from the inner shell of an atom is excited by the energy of a photon, it moves to a higher energy level. When it

Jan 23, 2026

[Tutorial Series] How to Build a Spectrometer – Ansys Optics

In this learning path, you will learn how to build a spectrometer. Spectroscopy is a non-invasive technique and one of the most powerful tools available to study tissues, plasmas and materials. The

Mar 04, 2026

Advances in X-Ray Imaging Crystal Spectrometer Design Through

Advances in X-Ray Imaging Crystal Spectrometer Design Through Raytracing¹
NOVIMIR PABLANT, M. BITTER, L. DELGADO-APARICIO, K.W. HILL, L. GAO, B.F. KRAUS,
Princeton Plasma Physics

Apr 19, 2026

SPECTRO xSORT XRF Handheld Analyzer for many

The new SPECTRO xSORT handheld XRF boasts numerous new features and designs aimed at enhancing user speed, ease, and convenience, while also

Feb 03, 2026

High-Resolution X-ray Spectroscopy: Instrumentation,

However, the data are limited to fairly bright X-ray sources. The recent JAXA's mission Hitomi opened a new window of high-resolution X-ray spectroscopy

May 23, 2026

Towards 10 meV resolution: The design of an ultrahigh

Abstract We present the optical design of the Centurion soft X-ray resonant inelastic X-ray scattering (RIXS) spectrometer to be located on the SIX beamline at NSLS-II.

Jul 04, 2025

Design of a 3000-Pixel Transition-Edge Sensor X-Ray Spectrometer

Here, we report on a non-destructive, tabletop approach that addresses this imaging problem through x-ray tomography, which we uniquely realize with an instrument that combines a scanning electron

Feb 14, 2026

Design and performance of a versatile curved-crystal spectrometer for ...

A complete in-vacuum curved-crystal x-ray emission spectrometer in Johansson geometry has been constructed for a 2-6 keV energy range with sub natural line-width energy

Feb 04, 2026

A high throughput and micrometre spatial resolution design for a ...

In this work, we present a design for a RIXS spectrometer that integrates high throughput and spatial-resolution operational modes.

Jun 22, 2026

Teledyne Princeton Instruments | Teledyne Vision

Teledyne Princeton Instruments design and manufacture high-performance spectrometers, as well as CCD, sCMOS, ICCD, EMCCD, eMCCD and InGaAs

May 28, 2026

Development of a Broadband high-resolution X-ray spectrometer with

X-ray diffraction spectroscopy and CMOS photon detectors are diagnostics commonly utilized in the toroidally bent crystal spectrometer. In Fig. 4, a detailed illustration of our new

May 10, 2026

Laboratory-based tender X-ray spectrometer for X-ray absorption fine ...

Abstract This study describes the design and performance of a laboratory-based tender X-ray spectrometer for X-ray absorption spectroscopy.

Apr 28, 2026

Five-analyzer Johann spectrometer for hard X-ray

Here, the design, alignment and data acquisition of a five-analyzer Johann spectrometer at the Inner Shell Spectroscopy beamline at the National

Nov 10, 2025

Highly efficient and aberration-free off-plane grating spectrometer and ...

We demonstrate a novel flat-field, dual-optic imaging EUV—soft X-ray spectrometer and monochromator that attains an unprecedented throughput efficiency exceeding 60% by design, along

May 09, 2026

High-resolution x-ray spectrometer for x-ray absorption

Two extended x-ray absorption fine structure flat crystal x-ray spectrometers (EFX's) were designed and built for high-resolution x-ray

Nov 29, 2025

Modular soft x-ray spectrometer for applications in energy sciences

We have developed a modular soft X-ray spectrometer design based on the Hettrick-Underwood optical scheme. We have constructed 5 spectrometers, four identical ones (called MXS)

Jan 18, 2026

Advances in X-Ray Imaging Crystal Spectrometer Design Through

Advances in X-Ray Imaging Crystal Spectrometer Design Through Raytracing Abstract Submitted for the DPP20 Meeting of The American Physical Society

Dec 07, 2025

A high throughput and micrometre spatial resolution design for a ...

A versatile resonant inelastic X-ray scattering spectrometer seamlessly switches between high throughput and broad spatial-resolution modes: (i) the high throughput mode enhances signal

Jun 07, 2026

Imaging x-ray spectrometer at the high energy density

The key properties of the spectrometer, including the spectral and spatial resolution, are demonstrated experimentally on different platforms.

Oct 04, 2025

Spectrometer Design Guide

Spectrometer designs made by using this guide should only be used as a starting point in your design process. If you are going to implement a spectrometer in hardware you should always use a

Feb 16, 2026

A seven-crystal spectrometer for high-energy resolution X-ray ...

A Johann-type X-ray spectrometer was successfully developed at the hard X-ray branch (in-vacuum undulator with a 24-mm periodic length) of the energy material beamline (E-line) at the

Mar 10, 2026

An improved laboratory-based x-ray absorption fine

X-ray absorption fine structure (XAFS) and x-ray emission spectroscopy (XES) are advanced x-ray spectroscopies that impact a wide range

Contact Us

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