

Primary Spectrometer Reel



AI Overview

The Primary Spectrometer Reel is the main energy analyzer in a REELS system, responsible for detecting and measuring the energy distribution of electrons reflected from a sample surface.

Function and Role In Reflection Electron Energy Loss Spectroscopy (REELS), a monoenergetic electron beam (typically 0.5–2.5 keV) is directed onto a solid sample. Electrons interact with the surface, scattering either elastically or inelastically. The Primary Spectrometer Reel collects these reflected electrons and measures their energy losses, producing a spectrum that reveals the electronic structure, band gaps, and surface defect states of the material. The spectrometer is designed to handle electrons that have undergone multiple inelastic scattering events, which is critical for accurate surface analysis. It can operate with adjustable energy resolution, allowing high-resolution measurements for detailed electronic information or high-sensitivity detection for surface composition studies.

Key Features

- Energy Range:** The primary spectrometer can analyze electrons with energies from below 100 eV up to 2,000 eV, depending on the system configuration.
- Detection Sensitivity:** It captures both elastically scattered (zero-loss) and inelastically scattered electrons, including plasmon peaks and defect-related energy losses.
- Integration:** Often part of a multi-technique surface analysis cluster, the spectrometer works alongside XPS, Auger, and UPS systems to provide complementary information.
- Vacuum Compatibility:** Designed to operate in ultra-high vacuum or moderately high vacuum conditions, sometimes with differential pumping to maintain performance.

Applications The Primary Spectrometer Reel enables:

- Determination of surface electronic band structure and band gaps.
- Detection of surface defects, such as oxygen vacancies or hydrogen content.
- Real-time monitoring of surface processes during deposition or cleaning in vacuum systems.

In essence, the Primary Spectrometer Reel is the central component of a REELS setup,...

Article Content

Halcyon Pathfinder Primary Reel

Halcyon Pathfinder Primary Reel Halcyon Pathfinder Primary reel are designed for the demands of deep wrecks and long caves, and have a long-standing reputation for excellence in quality and design.

Reflection Electron Energy Loss Spectroscopy

An electron source generates primary electrons of several keV energy that are impinging on a sample surface. The electrons are inelastically scattered by excitations of Phonons, Plasmons and Intra- and

Halcyon PATHFINDER™ Primary Reels 120m to 350m

Halcyon PATHFINDER™ Primary Reels Pathfinder reels are designed for the demands of deep wrecks and long caves and have a long-standing reputation for

Reflected Electron Energy Loss Spectroscopy (REELS)

Reflected electron energy loss spectroscopy (REELS) is a powerful analytical method used to investigate the surface electronic structure of a material. REELS can be used to determine electronic

REELS flyer upgrade

REELS is a surface analysis technique in which a specimen is bombarded with an electron beam (≤ 2000 eV) and the energy distribution of the reflected electrons is measured.

Energy Loss Spectroscopy REELS

A major advantage of REELS is the wide range of primary energies that can be used. AES and XPS use the variation of the incidence and take-off angles to perform in depth analysis.

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Secondary ion mass spectrometry

Solid samples can be imaged and chemically analysed using secondary ion mass spectrometry. This Primer describes the secondary ion mass spectrometry experimental setup, in

The Design of a Reflection Electron Energy Loss Spectrometer

This paper presents the design of a reflection electron energy spectrometer (REELS) attachment for low voltage scanning electron microscopy (LVSEM) applications.

Reflection Electron Energy Loss Spectroscopy (REELS)

The REEL spectrum displays the intensity distribution of the reflected electrons as a function of the energy loss and is particularly sensitive to the electronic structure of surfaces.

Polarization analysis on the LET cold neutron spectrometer using a

ISIS Neutron and Muon Source, UK. We will begin by reviewing our previous work on the characterization of the polarized primary spectrometer in section 2 (7), before discussing the

Reflection Electron Energy Loss Spectroscopy

A theoretical investigation is presented of the role of transport processes on energy spectra in reflection electron energy loss spectroscopy (REELS) and X-ray photoelectron spectroscopy (XPS).

The Design of a Reflection Electron Energy Loss Spectrometer

The research work presented here carries out a direct ray-tracing simulation to re-design the present SE toroidal energy analyzer attachment to acquire REELS information inside the SEM. The REELS

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User's Guide

Figure 1.2, shows the REELS spectrum from an Fe foil obtained with a 990 eV primary electron beam . The measured spectrum contains intensity from electrons that have lost energy in multiple

Recoil-proton track imaging as a new way for neutron ...

Recoil-proton track imaging (RPTI) is an attractive technique to optically record the tracks of recoil protons in scintillation gas by using realtime imaging devices. For the first time, its use ...

A neutron spectrometer based on recoil proton track imaging for high ...

A neutron spectrometer based on recoil proton track imaging for high-yield inertial confinement fusion primary deuterium-tritium neutrons

Pathfinder Primary Reel

Dive deeper with Halcyon Pathfinder Primary Diving Reel. Designed for deep wrecks and caves, it offers a precision-fit handle and a one-year warranty.

Spectrometers

Unlock precise, real-time insights with compact Ocean Optics spectrometers covering UV-Vis, NIR, Raman and more. Find the perfect spectrometer device for your spectroscopy applications with our

Guideline Dive Reels | Dive Gear Express®

Common reel applications and their minimum line length requirements: Jump: {50 ft | 15 m}, Sport: {100 ft | 30 m}, Safety: {125 ft | 40 m}, Flag: {150 ft | 50 m}, Tech:

Improving the transmission and flexibility of neutron primary ...

Many types of neutron spectrometer use a conventional primary spectrometer consisting of some collimator, a crystal monochromator and a second collimator. This article develops the

Analysis of Reflection Electron Energy Loss Spectra (REEL

and successfully tested using REELS spectra of Fe, Co and Ni. The resulting optical data and quantities derived from them such as the mean free path for inelastic electron scattering are in good agreement

The new NG-5 | NIST

This will allow us to fully optimize the primary spectrometer to maximize the flux at the sample position of an instrument that will be located at the end of NG-5 near the current location of

Fishing Reel Parts Diagram and Functionality Breakdown

Explore the different parts of a fishing reel with a detailed diagram. Learn about each component and its role in the performance of your reel.

Contact Us

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