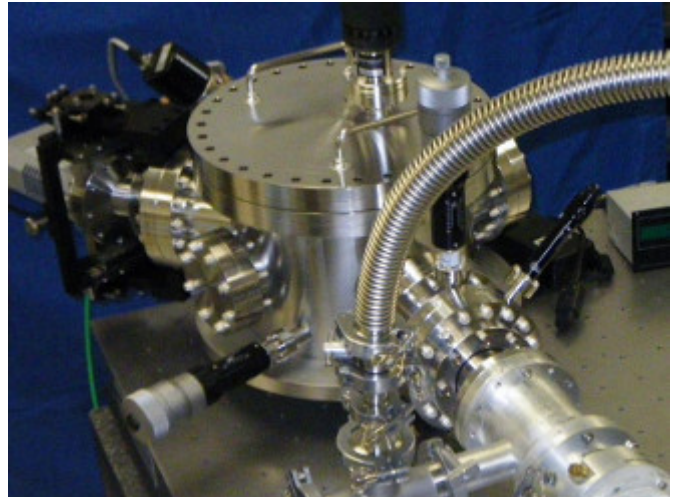


Flat Field Spectrograph

- **Aberration corrected toroidal gratings**
- **Easy coupling of flat detectors (MCP or CCD)**
- **Flat field for direct detection with CCDs**
- **Rapid spectral data collection**
- **Ultra High Vacuum (UHV)**



Vacuum ultraviolet spectrograph collects a wide wavelength range in one acquisition. Three different diffraction gratings are available for work from about 10nm to 160nm. Each offers different spectral resolution and spectral range; they work in the soft x-ray (SXR, XUV), extreme ultraviolet (EUV), and VUV. This is a practical instrument for applications requiring rapid data collection from transient, short lived events. Examples include fusion plasmas (<http://www.pppl.gov/LTX>) formed in tokamak devices, laser ablation, liquid droplet EUVL sources (<http://www.xuv.com/xenon.html>), and Xenon plasma at 13.5nm (<http://www.cymer.com/plasma-chamber-detail>) considered for extreme ultraviolet lithography.

The flat field toroidal grating instruments works over a fixed wavelength range. The prescription of the toroid and aberration correction determines the optimum region of use. Due to intensive design and difficult optical fabrication selection of gratings is limited. If there is a grating available for your wavelength of interest, you are in luck! These instruments exhibit relatively simple opto-mechanical systems that deliver good imaging and fair spectral resolution. They also allow use of a direct detection CCD to acquire high-energy spectra. Fragile microchannel plate (MCP) intensifiers can be reserved for those systems requiring gating.

Specifications & Additional Information:

Specifications	Drawing	Configurations	Sample Spectra	Publications
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Specifications

Optical Design	Toroidal Grating Flat Field Spectrograph
Angle of Incidence	~71 degrees
Focal Length	292.1 mm
Acceptance	24 mrad
Wavelength Range	refer to grating of interest for range
Grating(s)	Single, kinematic grating holder. Two grating turret optional.
Slit	Continuously variable micrometer actuated width 0.01 to 1 mm. Settable height.

Vacuum	Ultra High Vacuum 10E-9 torr standard
Focal Plane	40 mm microchannel plate or 25 mm direct detection CCD

Performance with various diffraction gratings:

Grating Groove Density (g/mm)	2105	450	290
Spectral Resolution (nm,FWHM)	0.05	0.1	0.16
Focal Plane Width (mm)	40	40	40
Wavelength Range (nm)	9.5 to 32	10 to 110	15.5 to 170
Energy Range (eV)	130 to 39	124 to 11	80 to 7

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