

Single bunch operation, the generation of
ultra-short light pulses at storagerings and their application
KEK, Japan
Feb 28-Mar 1, 2005

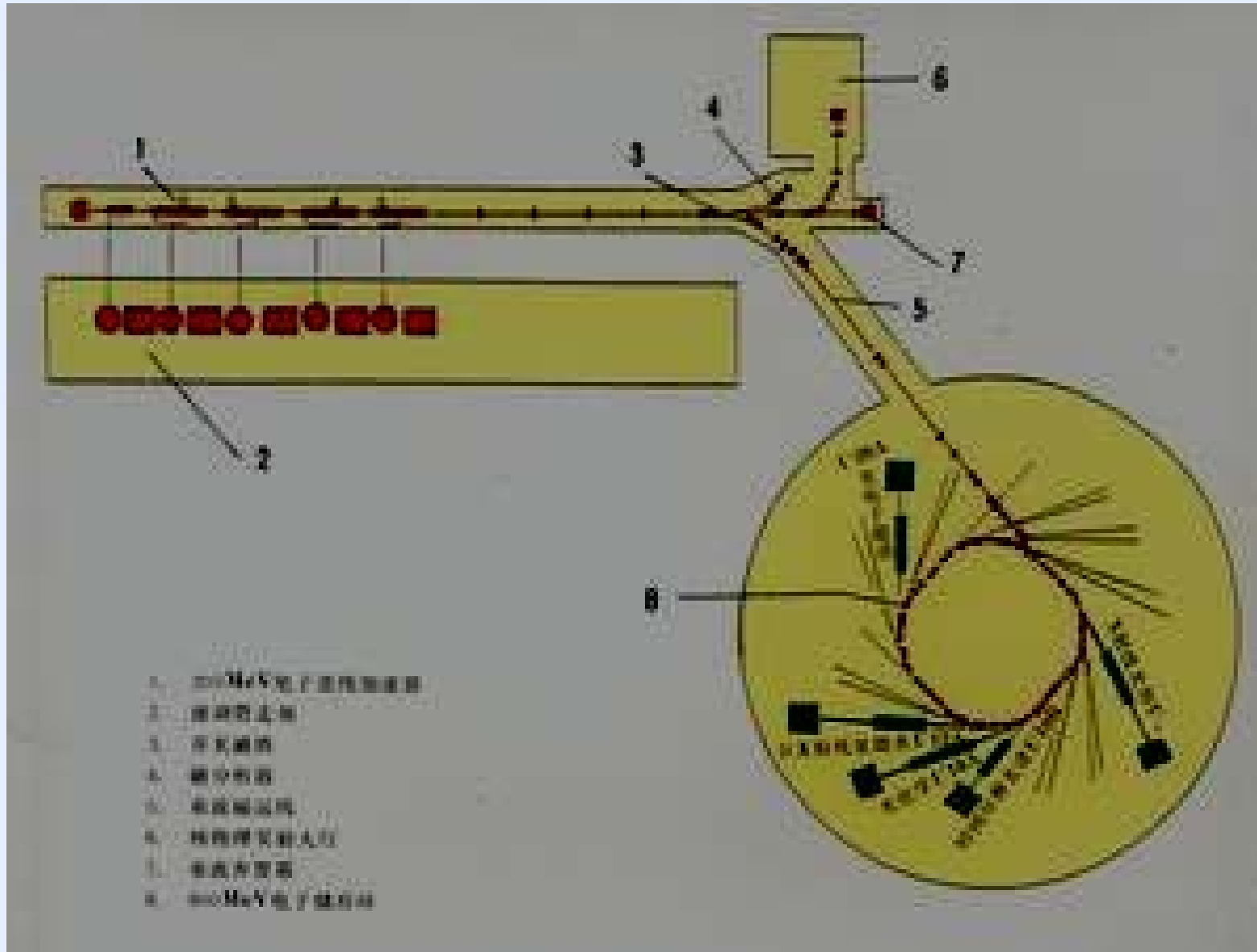
Introduction of the time-resolved single-photon- counting VUV spectroscopy at NSRL

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Introduction of NSRL



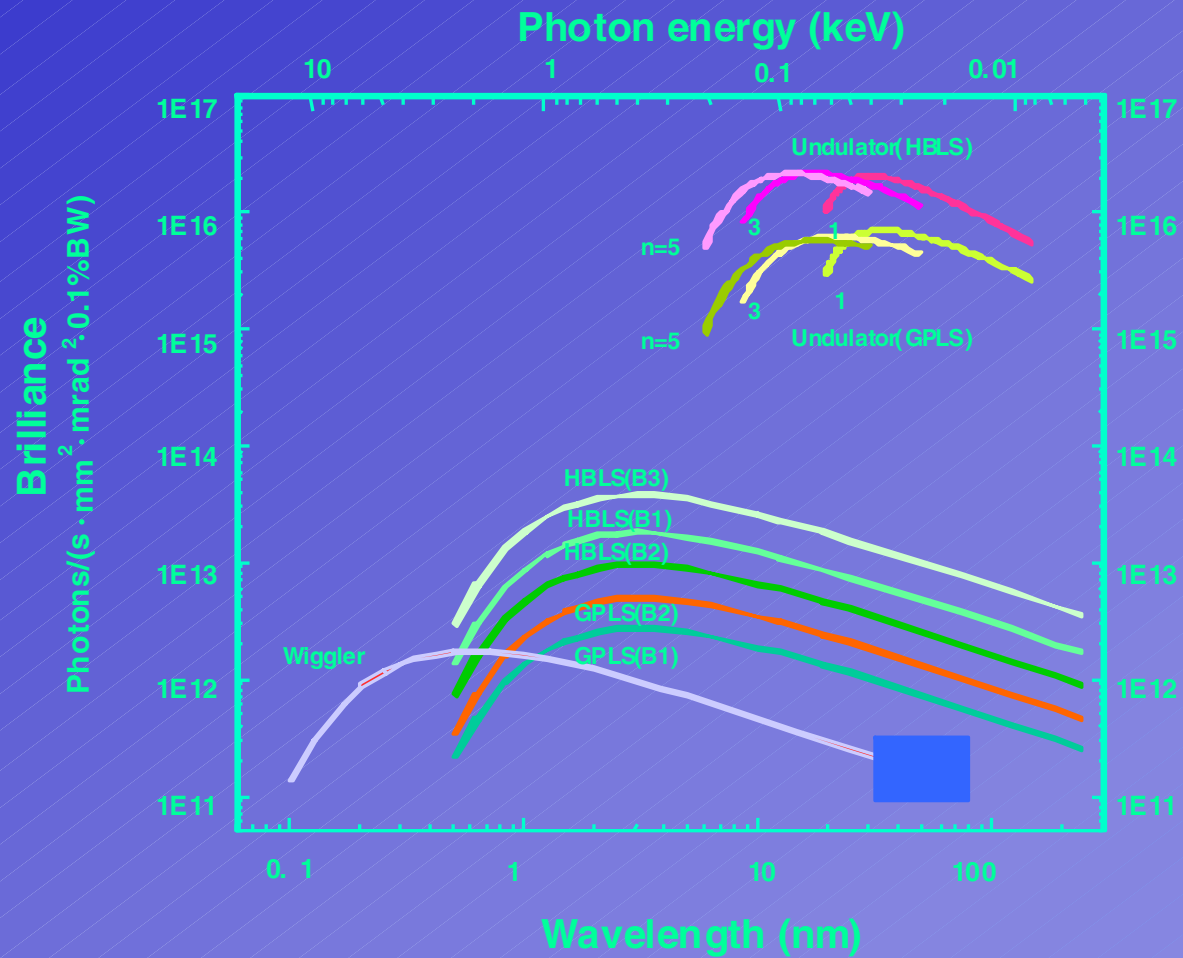
Introduction of NSRL

Main parameters of HLS ring

• Electron Energy	E	800 MeV
• Beam Current	I	100-300 mA
• Bend Field	B	1.2 Tesla
• Curvature Radius	ρ	2.22 m
• Char. Wavelength	λ_C	24(4.8) Å
• Circumference	L_C	66.13 m
• RF Frequency	f_{RF}	204 MHz
• Harmonic Number	h	45
• Revolution Period	T_C	220 nS
• E-Loss /e ⁻ / turn	U_o	16.3 keV

Introduction of NSRL

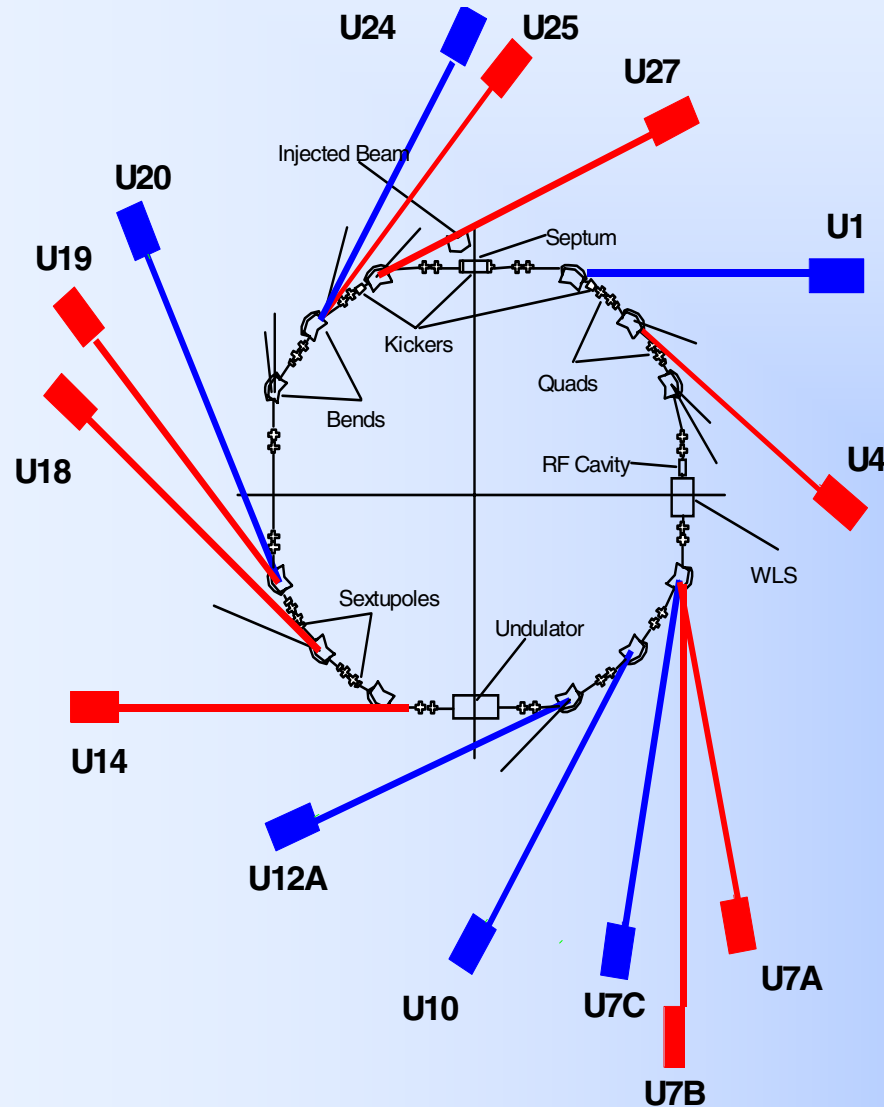
Brilliance from HLS



Introduction of NSRL

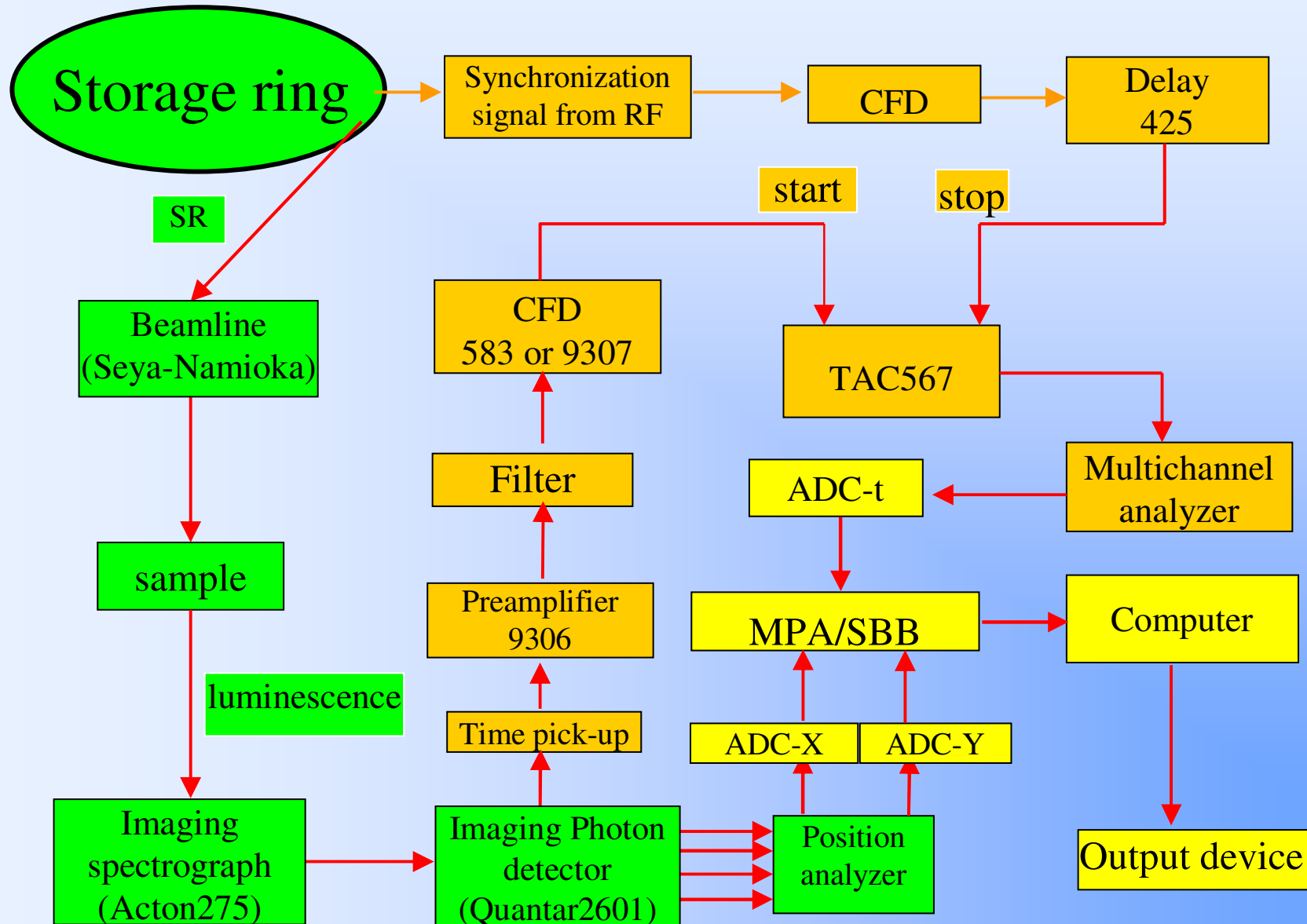


Introduction of NSRL-beamlines and endstations



- U1 X-ray lithography
- U4 IR and Far IR Spectroscopy
- U7A LIGA
- U7B XAFS
- U7C X-ray Diffraction and Scattering
- U10 Photo-Chemistry
- U12A Soft X-ray Microscopy
- U14 Atomic and Molecular Spectroscopy
- U18 Soft X-ray MCD
- U19 Surface Physics
- U20 Photoelectron Spectroscopy
- U24 VUV Time-Resolved Spectroscopy
- U25 VUV Circular Dichroism Spectroscopy
- U27 Metrology and Spectral Radiation Standard

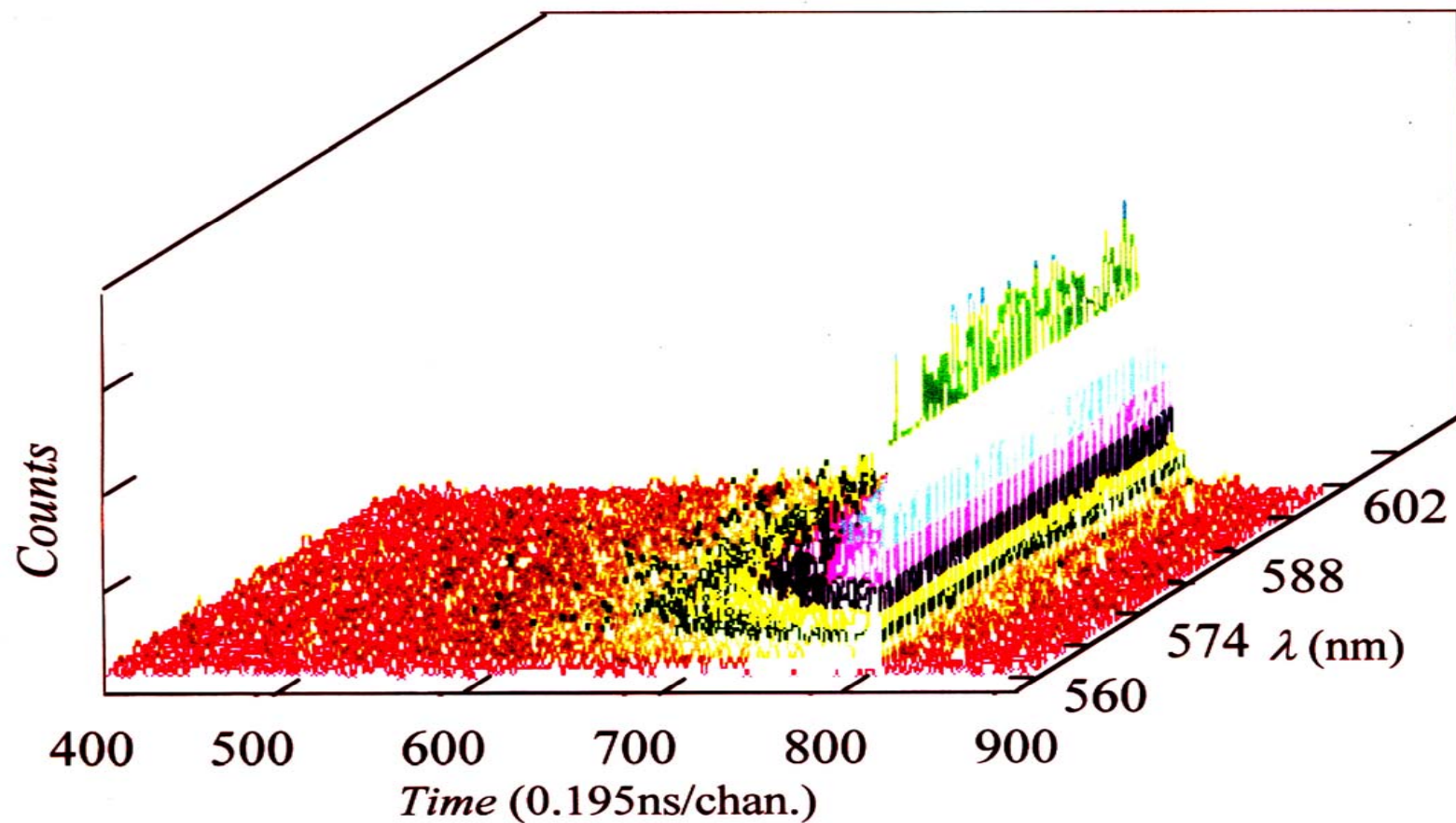
Single photon counting system



Single photon counting system

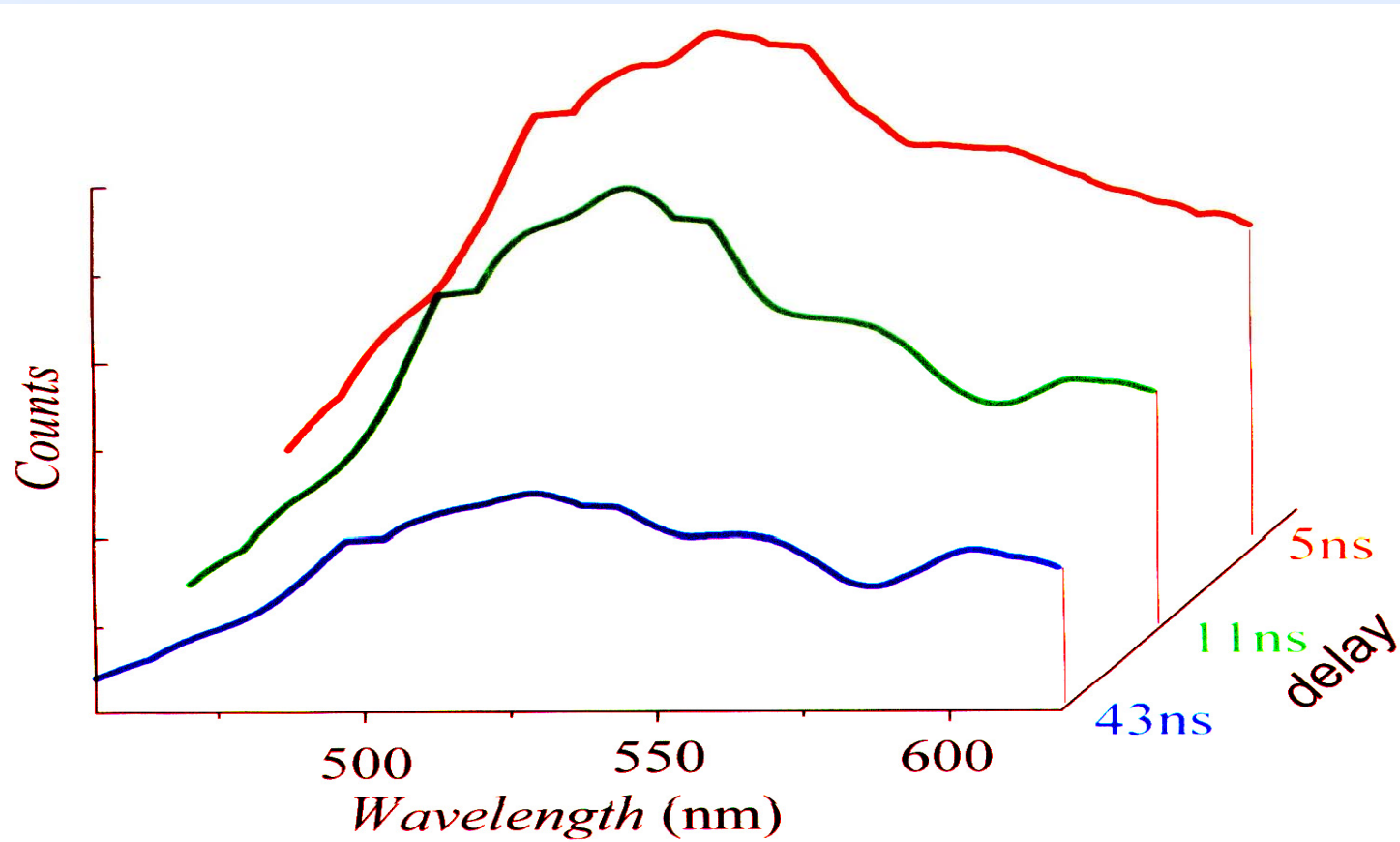


Examples



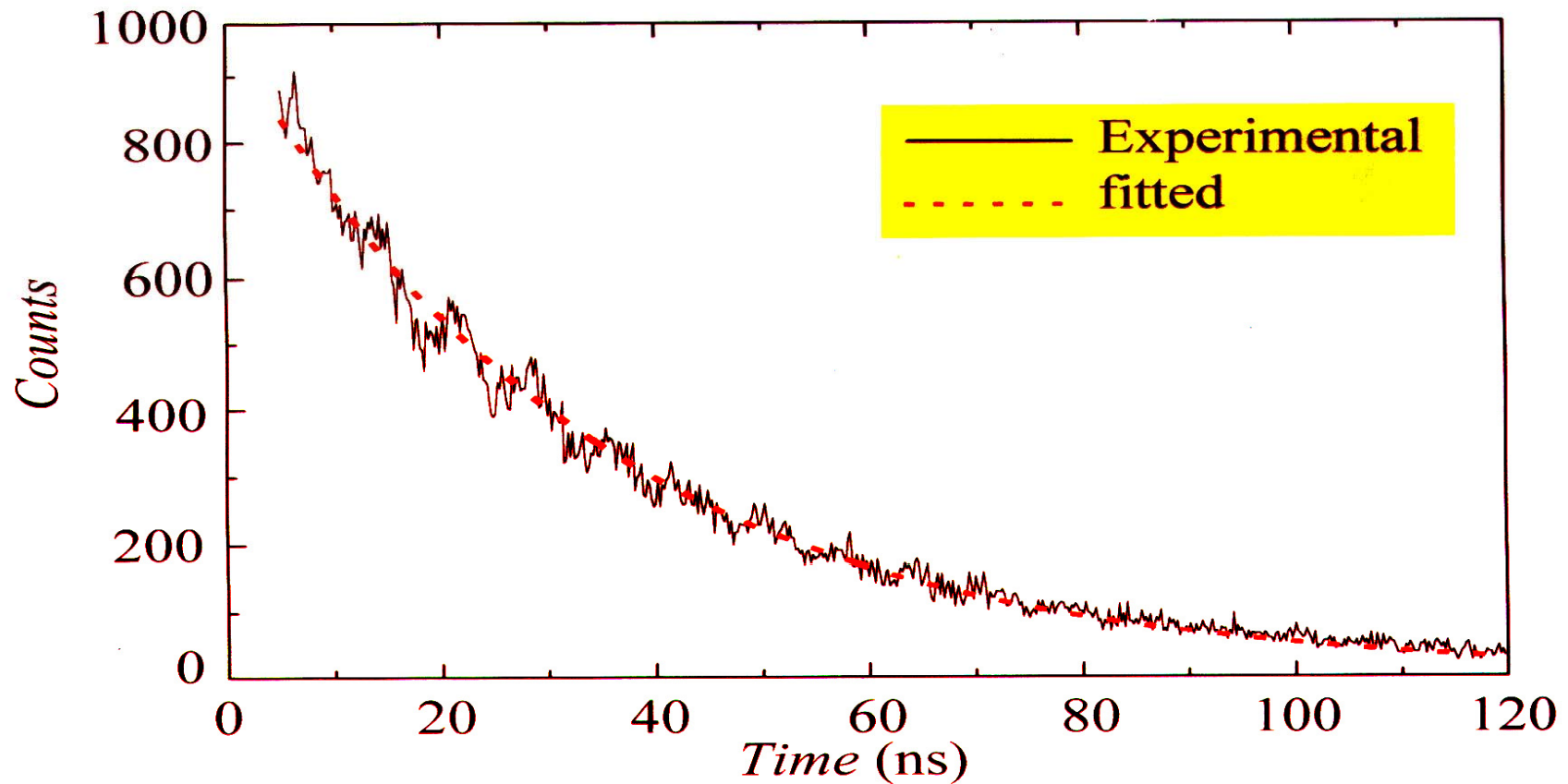
The time-resolved spectroscopy of Rh-6G aqueous solution excited by 400nm photon

Examples



The time-resolved spectroscopy of ALQ:Ce excited by 400nm photon.

Examples



The decay time of ALQ:Ce at 520nm emission excited by 400nm photon ($\tau=33.9\text{ns}$)



Thank You!

VUV beamline(Seya-Namioka)



Wavelength range:

40-350nm

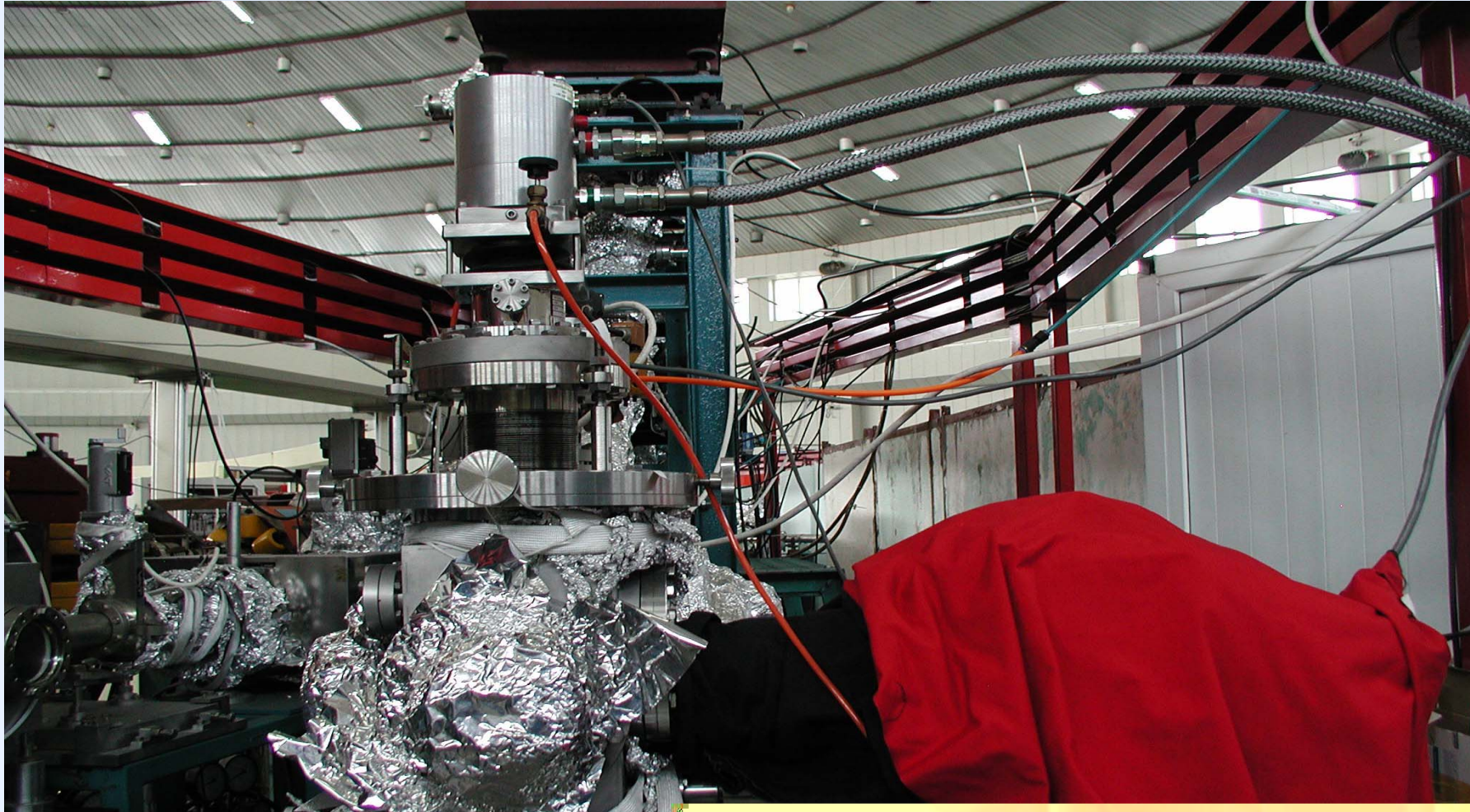
Resolve power:

>500

Flux at sample:

10^{10} ph/s (I=200mA)

VUV Endstation



Specifications of the Imaging Spectrograph

Optical System:

Czerny-Turner type

Focal Length:

275mm

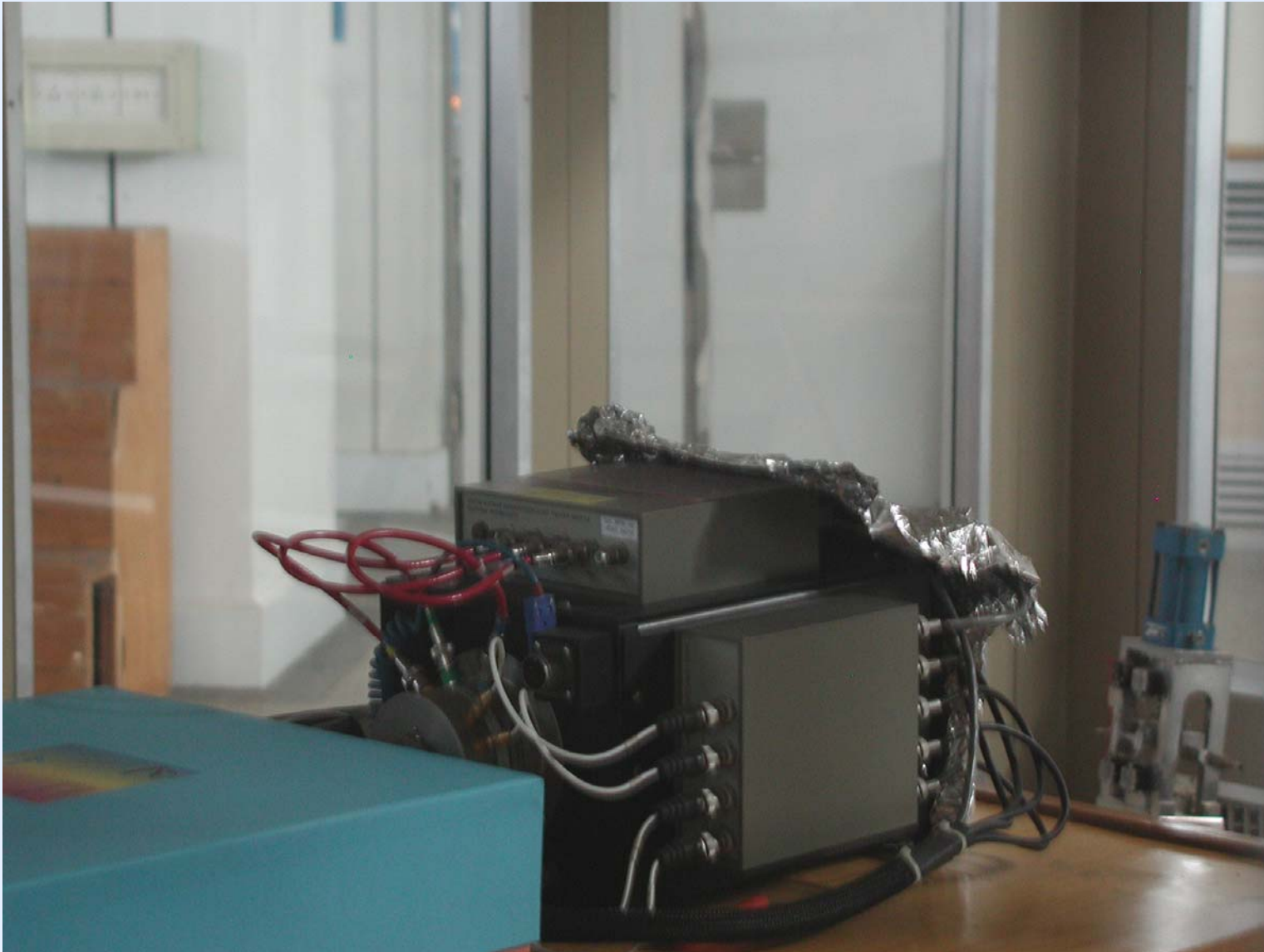
Resolution:

0.1nm with standard 1200g/mm grating, 10 \star m slit

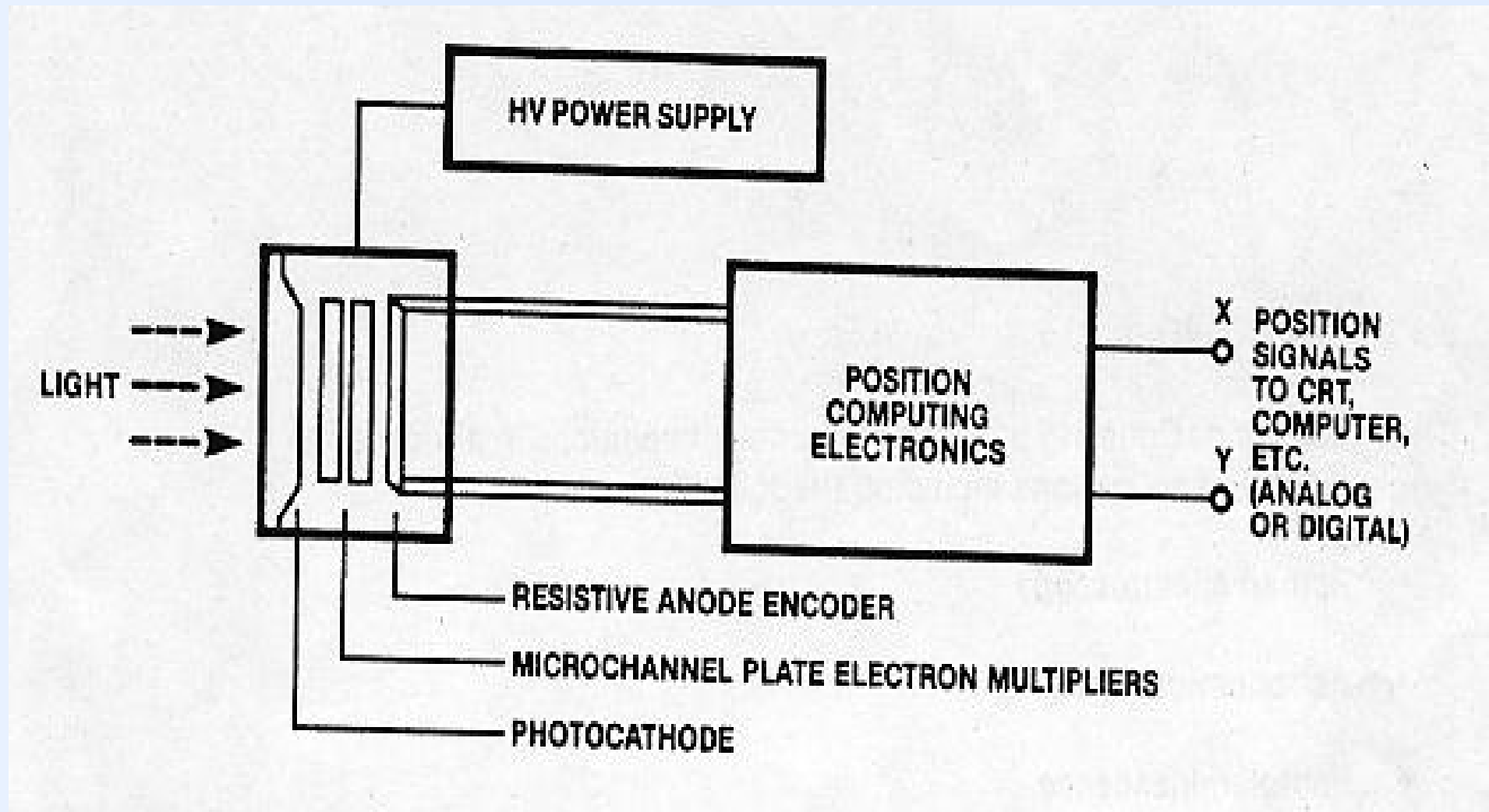
Focal plane detector compatibility:

provides nominal 592nm coverage with 150g/mm grating, 293nm with 300g/mm grating, 143nm with 600g/mm grating, and 67nm with 1200g/mm grating at 500nm

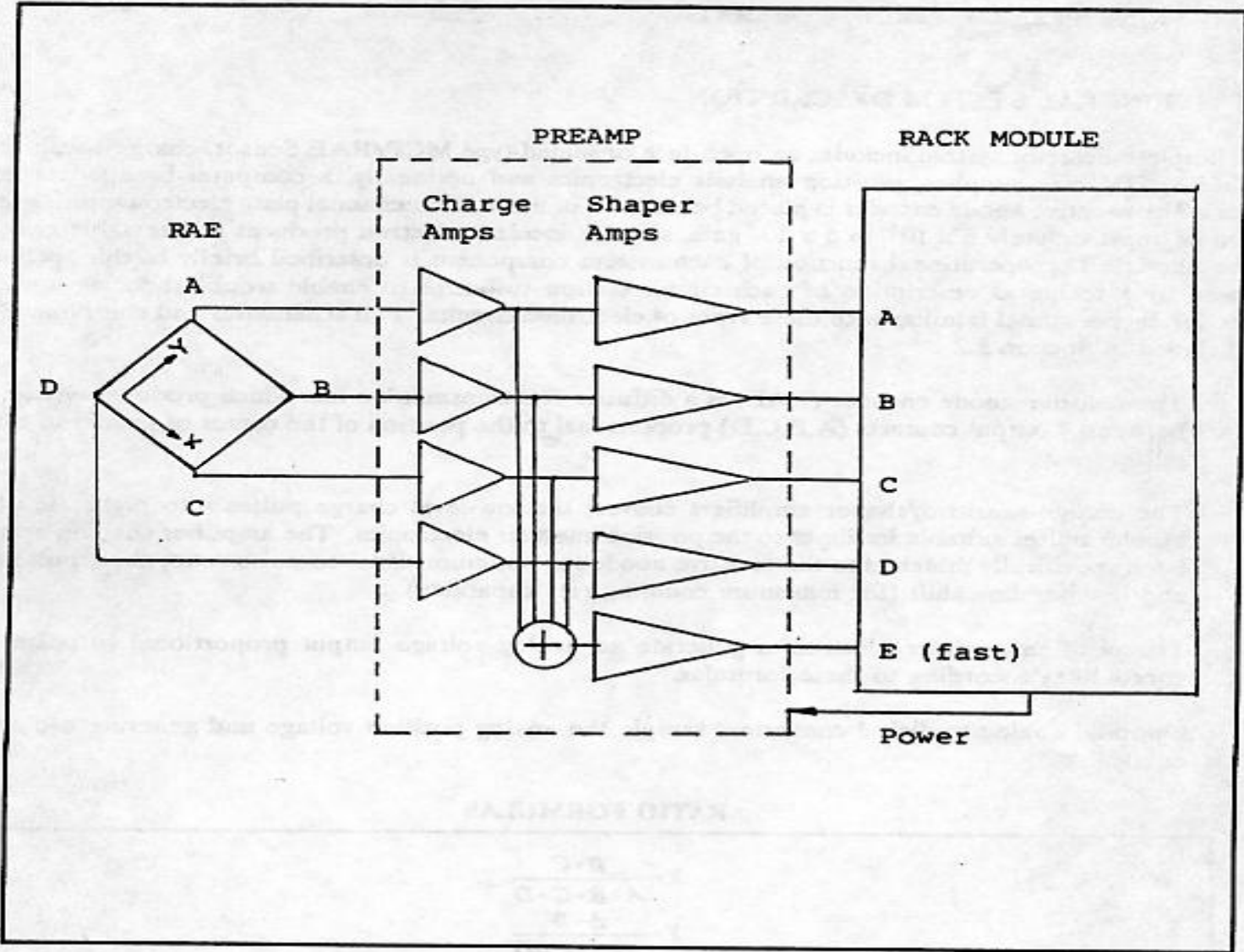
2D Imaging detector-MCP/RAE



2D Imaging detector-MCP/RAE



Functional Diagram



Position Analyzer



TAC



Single bunch operation

