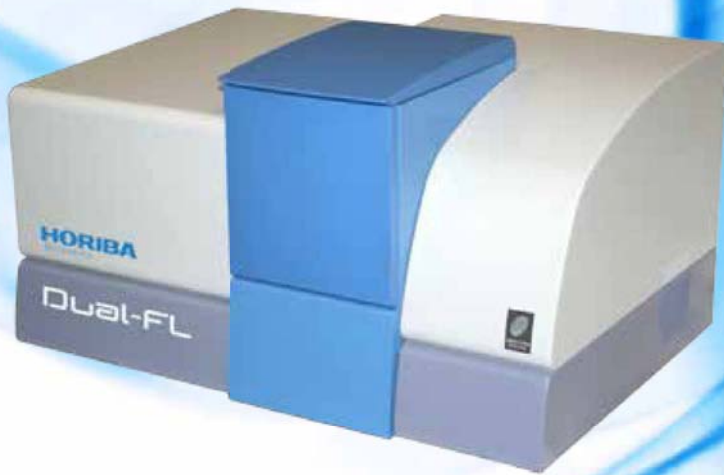


HORIBA

Scientific



Dual-FL

- World's Fastest Fluorometer
- Measure absorbance spectra and fluorescence simultaneously

ELEMENTAL ANALYSIS

FLUORESCENCE

GRATINGS &
OEM SPECTROMETERS

OPTICAL COMPONENTS

FORENSICS

PARTICLE CHARACTERIZATION

RAMAN

SPECTROSCOPIC ELLIPSOMETRY

SPR IMAGING





100 Times Faster Data Collection



**The only simultaneous absorbance
and fluorescence system
available today!**



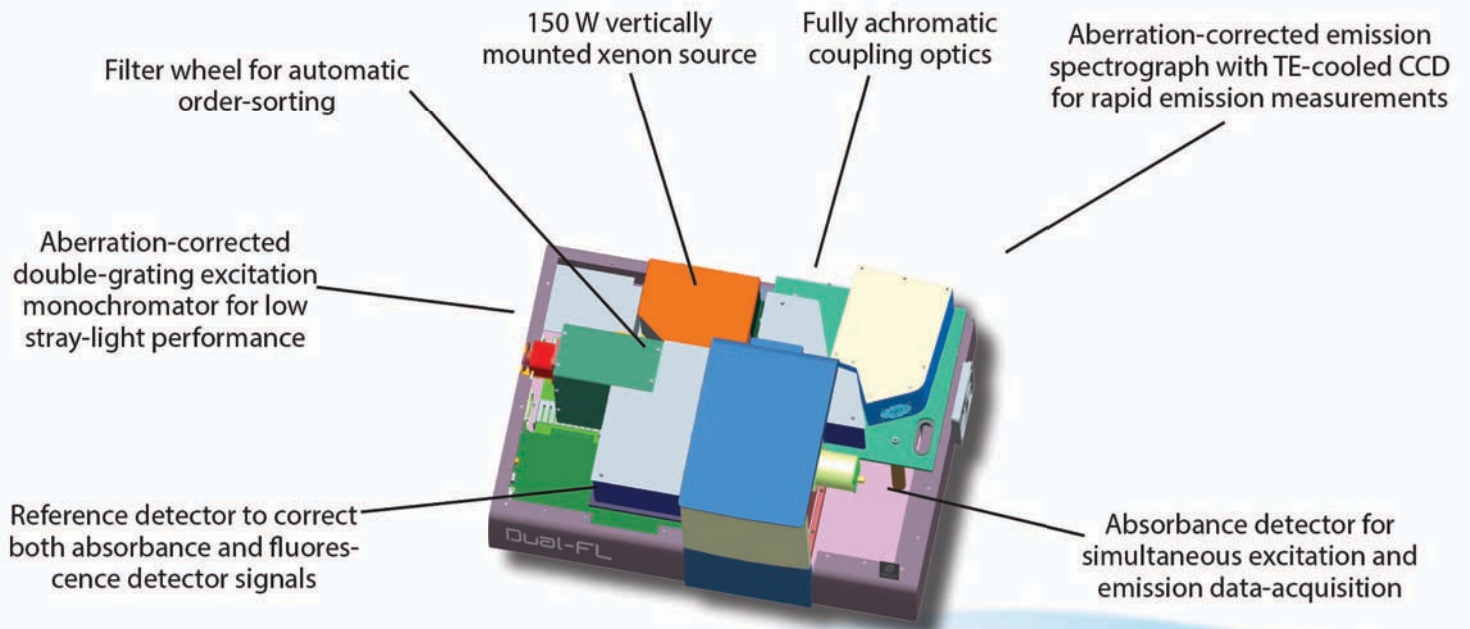
The new Dual-FL is the only instrument to simultaneously measure both absorbance spectra and fluorescence Excitation-Emission Matrices. EEMs are acquired up to 100 times faster than with other instruments. Dedicated software automates correction of inner-filter effects and Rayleigh and Raman scattering lines, enabling rapid extraction of information from simple or complex data sets.

Hardware Features

- The only true simultaneous absorbance-fluorescence system available
- TE-cooled CCD fluorescence emission detector for rapid data acquisition up to 100 times faster than any other fluorometer
- Corrected UV-VIS absorbance detection path for stability and accuracy
- Double grating excitation monochromator for superior stray light rejection
- Matching bandpass for absorbance and fluorescence spectra
- Automatic sample changer option (2- or 4-position)
- Compatible with flow cells and titrator

Full suite of performance validation tests

- NIST Fluorescence Standard Reference Materials for spectral calibration and correction (SRMs: 2940, 2941, 2942, 2943)
- NIST Absorbance Standard Reference Materials for Ultraviolet-Visible Spectrophotometry (SRM 931g)
- Starna® Standard Reference Materials for Ultraviolet-Visible Spectrophotometry (RM-06HLKI)
- Water Raman signal-to-noise evaluation

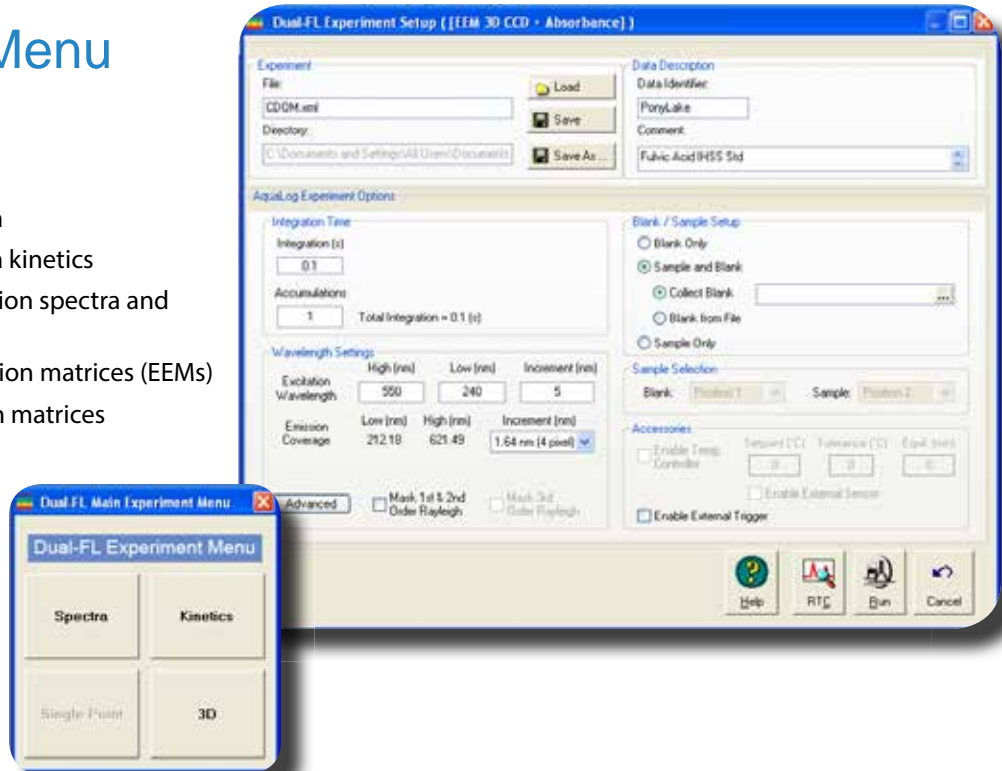


Software Features

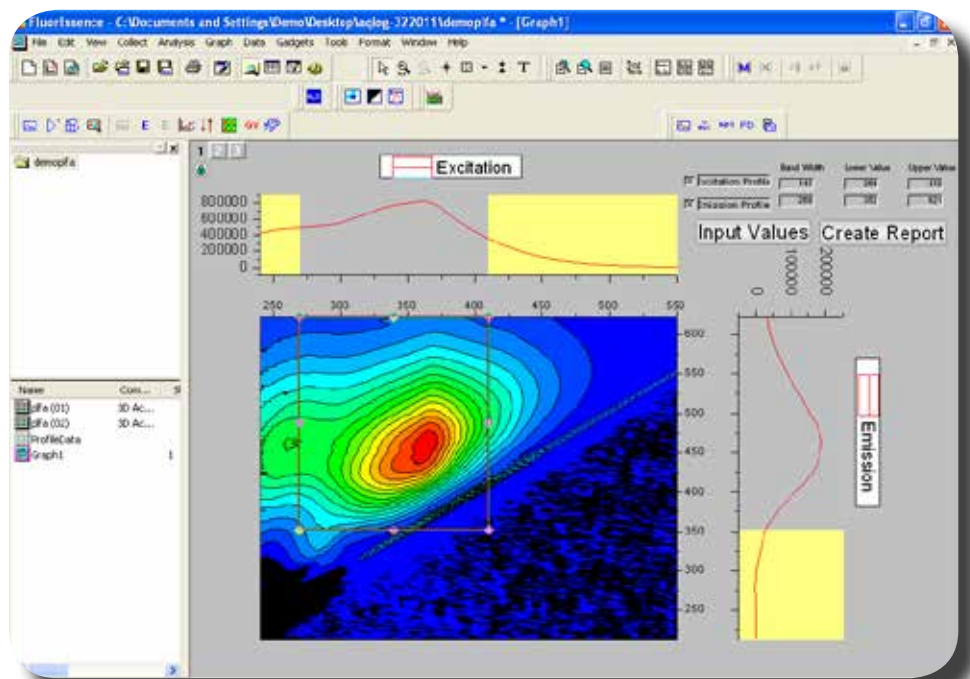
- Optimized experiment set-up menus minimize user configuration time
- Complete NIST-traceable corrected fluorescence spectra automatically generated
- Spectral and kinetic analysis tools for both absorbance and fluorescence data
- Methods and batch protocols for automating multiple sample measurements

Experimental Menu

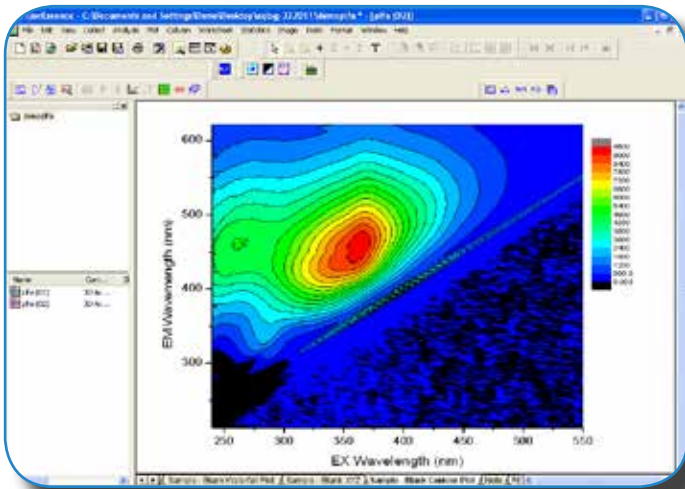
- Absorbance spectra
- Absorbance kinetics
- Fluorescence emission spectra
- Fluorescence emission spectra kinetics
- Combined fluorescence emission spectra and absorbance kinetics
- Fluorescence excitation-emission matrices (EEMs)
- Combined excitation-emission matrices and absorbance spectra
- Single point experiment



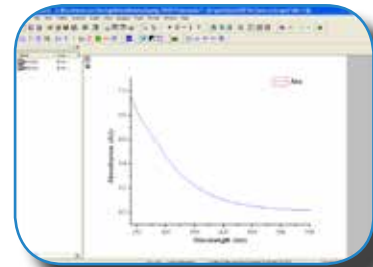
2-Dimensional excitation and emission spectral profile extraction from EEMs



Built-in EEM Correction Tools: Getting a corrected spectrum has never been easier!

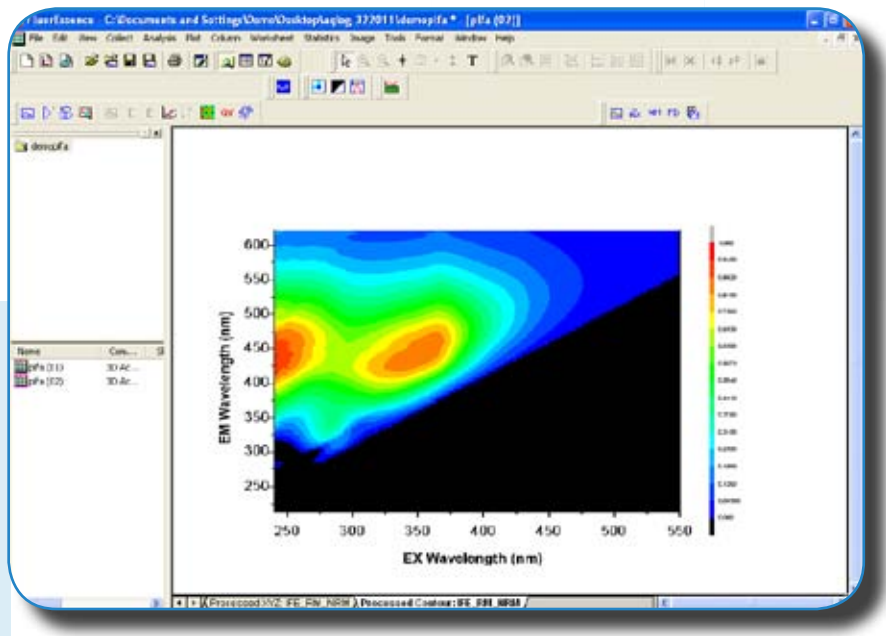


Uncorrected "apparent" spectrum



Simultaneously collected
absorbance spectrum

1. Inner-filter effect correction
2. Rayleigh Masking (1st and 2nd grating orders)



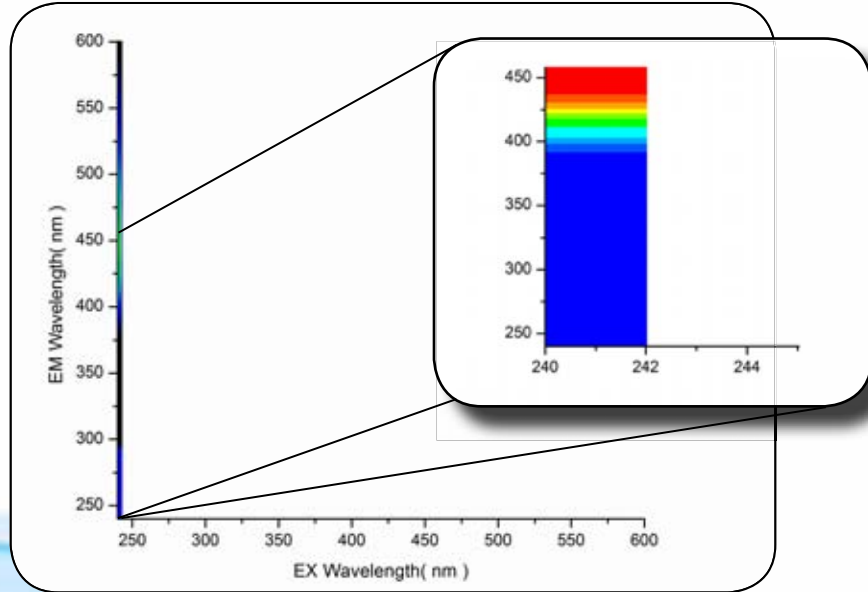
Corrected actual spectrum

Optional
Batch EEM
export

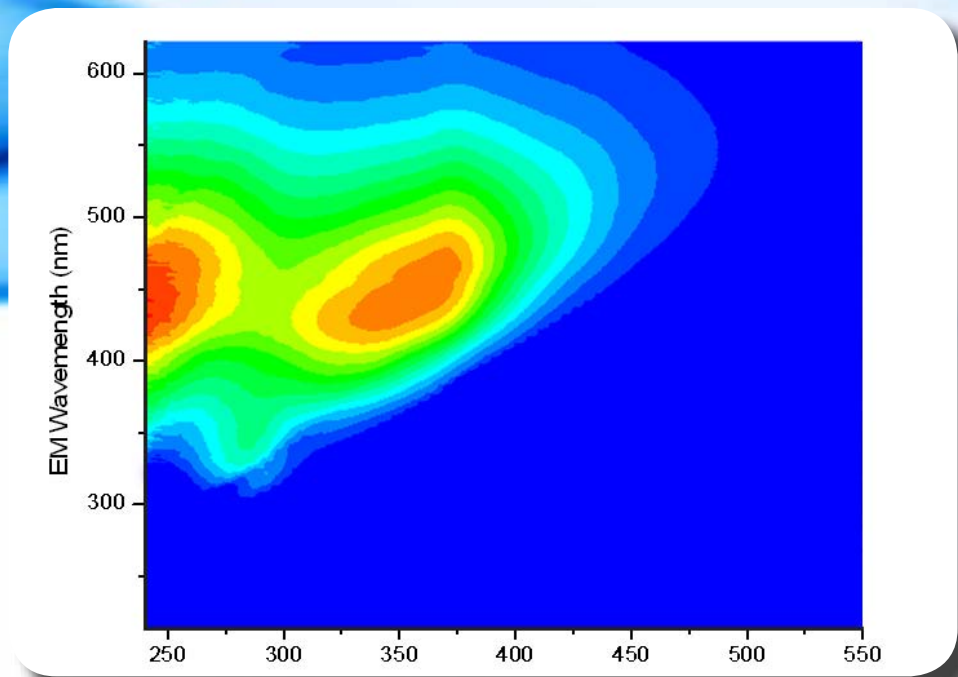
Multivariate Analysis
e.g. PARAFAC
(Parallel Factor Analysis)

World's Fastest Fluorometer

17 Second Conventional Fluorometer Data Acquisition



17 Second Dual-FL Data Acquisition



Fluorescence Hardware Specifications

Parameter	Specification
Choice of light source	Extended-UV: 150 W vertically mounted xenon arc lamp
Excitation range	200 nm to upper limit of emission detector
Excitation bandpass	5 nm
Excitation monochromator	Subtractive double monochromator
Excitation gratings	1200 gr/mm; 250 nm blaze
Excitation wavelength accuracy	±1 nm
Choice of detector	Red-extended
Emission range	250–800 nm
Emission grating	285 gr/mm; 350 nm blaze
Hardware pixel-binning	0.58, 1.16, 2.32, 3.64 nm/pixel
Emission bandpass	5 nm
Emission spectrograph	Fixed, aberration-corrected 140 mm focal length
Emission detector	TE-cooled back-illuminated CCD
Emission integration time	5 ms minimum
CCD gain options	2.25 e ⁻ /cts in high gain, 4.5 e ⁻ /cts in medium gain, 9 e ⁻ /cts in low gain
Sensitivity	Water-Raman SNR > 20 000:1 (RMS method) (350 nm excitation, 30 s integration)
Weight	33 kg (72 lbs)
Dimensions	L x W x H (618 x 435 x 336 mm); (24" x 17" x 13")

Absorbance Hardware Specifications

Parameter	Specification
Scanning range	200–800 nm (UV lamp)
Bandpass	5 nm
Slew speed	Maximum 500 nm/s
Optical system	Corrected single-beam
Detector	Si photodiode
Wavelength accuracy	±1 nm
Wavelength repeatability	+/- 0.5 nm
Photometric accuracy	±0.01 AU from 0 to 2 A
Photometric stability	<0.002 AU per h
Photometric repeatability	+/- 0.002 AU (0 to 1 AU)
Stray light	<1% measured with KI standard



The Most Complete Line of Fluorescence Instruments

Steady-State
Lifetime
Microspectroscopy

www.fluorsolutions.com



info.sci@horiba.com

www.DualFluor.com

HORIBA
Scientific

USA: +1 732 494 8660
UK: +44 (0)20 8204 8142
China: +86 (0)21 6289 6060

France: +33 (0)1 69 74 72 00
Italy: +39 2 5760 3050
Brazil: +55 (0)11 5545 1500

Germany: +49 (0)89 4623 17-0
Japan: +81 (0)3 6206 4721
Other: +33 (0)1 69 74 72 00