Avio 200 “Treasure”

ICP-OES Launch

PerkinElmer®
For the Better

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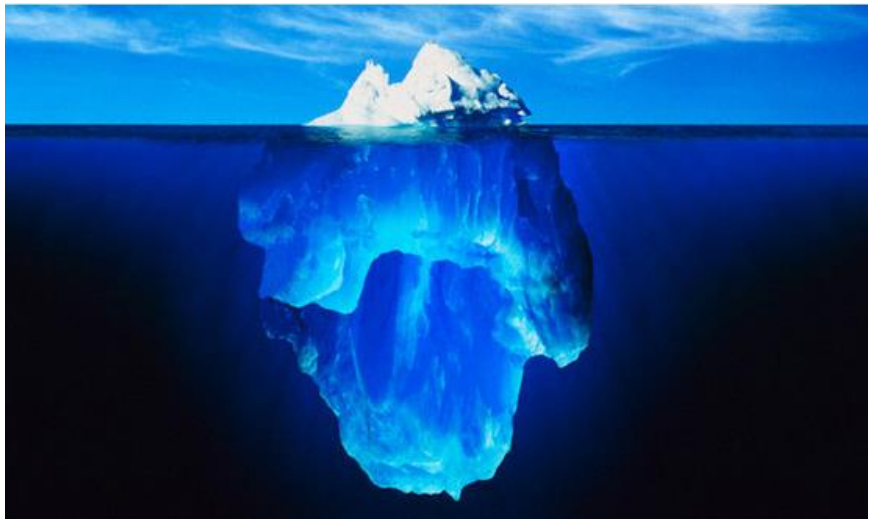
Budapest, October 17th 2016

Avio™ 200 ICP-OES



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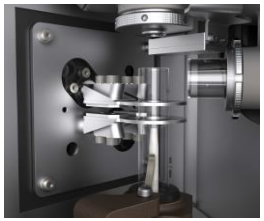
Avio™ 200 ICP-OES



Flat Plate Plasma Technology

- More robust and stable plasma
- Greatest matrix tolerance
- Lowest argon consumption (half that of traditional load coils)
- Less maintenance

Color PlasmaCam

-Simplifies method development by allowing continuous viewing of the plasma
-Remote diagnostic capabilities for superior uptime

Syngistix Version 2.0

Pre-set Methods to match Available Application Notes

RF Generator

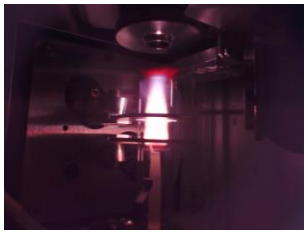
fourth generation 40 MHz, free-running, solid state RF generator that provides an efficiency rate of more than 81%

Small Footprint

- 65 x 81 x 76 cm (W x D x H)
- Saves valuable laboratory bench space

Vertical Torch

- Optimal performance for any sample type
- Quick and easy to adjust for simple maintenance
- Torch mount ensures easy, accurate realignment after removal



Patented Dual View

-Optized plasma viewing both axial and radial
- Measures elements with high and low concentrations in the same run, regardless of wathelength

New 4-Channel, 12-Roller Peristaltic Pump

-Delivers greater sample-introduction flexibility
- Enhances and optimizes stability

PlasmaShear System

-Argon-free interfernce removal
-Maintenance-free design (no cones to clean or high extraction systems)

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Capability and Affordability

- Smallest ICP on the market
- Lowest argon consumption of any ICP
- Offers the fastest startup
- Superior sensitivity and resolution
- Wide linear range with dual view technology

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Size matters

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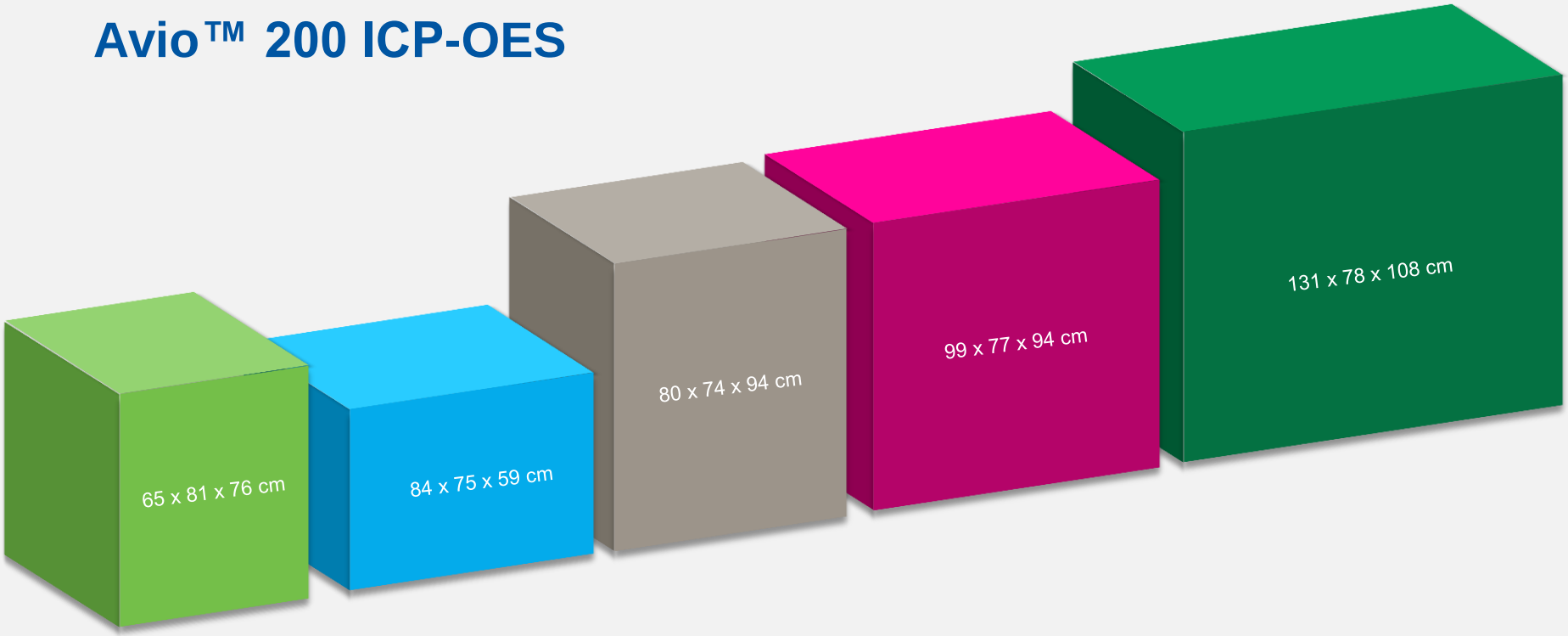

Avio 200

Smallest ICP on the market

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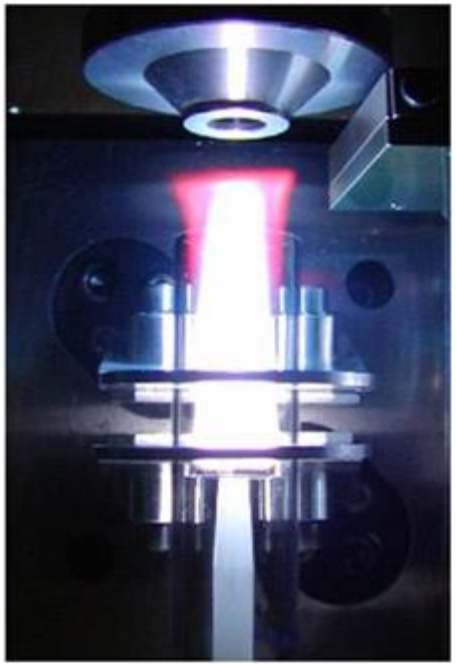
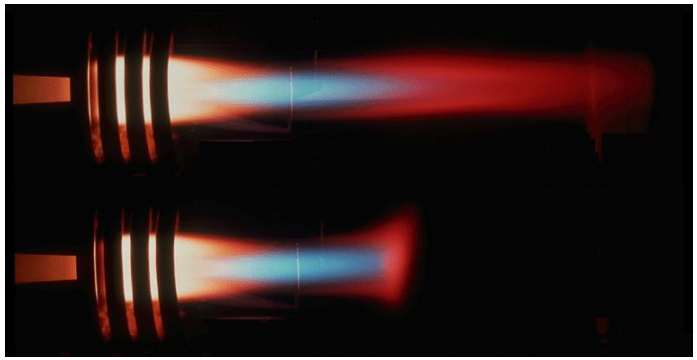
New Plasma Generation Technology

Patented Flat “Induction Plate” Design

- Generates a unique symmetrical plasma
- Optimal performance at reduced argon flow while preserving stability and precision
- Reduced cost of ownership
- Long-life aluminum plates





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Lowest Argon consumption on the market

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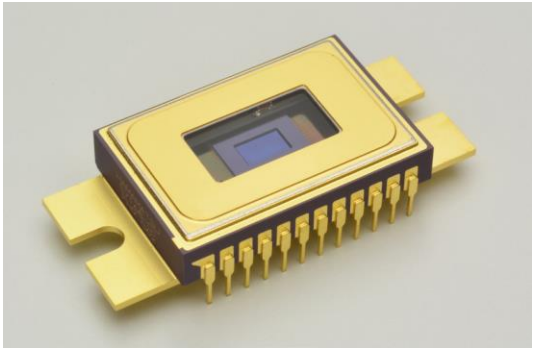
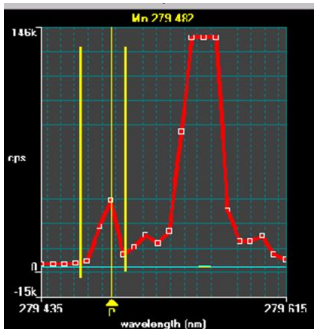
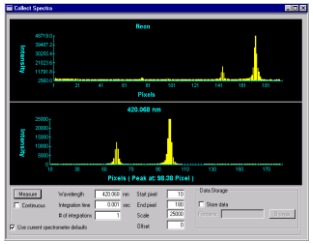


Charge-Coupled Device (CCD) array detector





Key Benefits

- Superior quantum efficiency delivers enhanced analytical performance and superior detection limits
- Simultaneous background correction further improves analytical accuracy and detection limits
- Patented Dynamic Wavelength Stabilization™ increases analytical reproducibility and reliability

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Fastest Start up

- 10 minutes from cold
  - No gas
  - No electricity
- How? DWS – Dynamic Wavelength Stabilisation
  - Use of the Neon reference source corrects for any peak shift due to temperature and purge (or lack of)

Feature

- Uses a Neon line to correct for any drift
- Uses this correction on every replicate of every element

Benefits

- Excellent stability despite changing laboratory environment
- Best precision and accuracy

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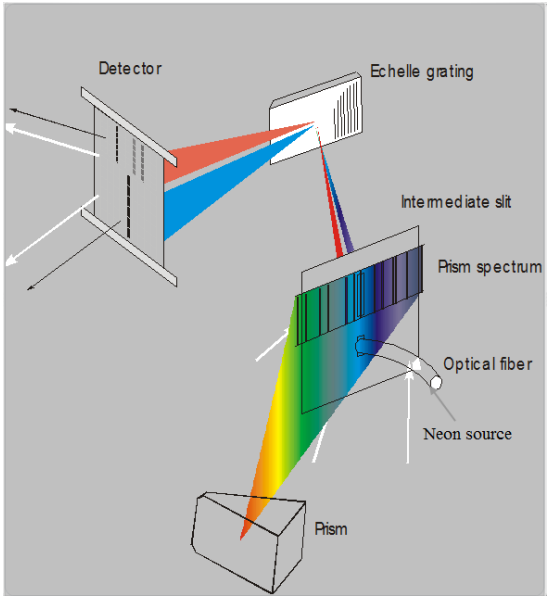
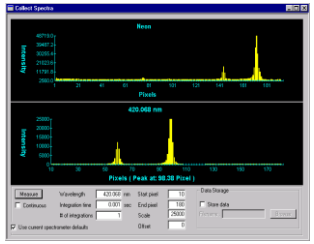
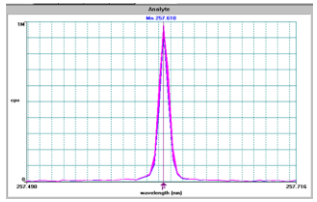
Avio 200: DWS-Dynamic Wavelength Stabilization

- Cold start – eliminates warm up time so your lab can be up and running in a matter of minutes
- No argon consumption or chiller noise when not in use
- Exceptional wavelength stability
- All wavelengths are automatically referenced to Neon in real time to eliminate wavelength drift
- Allows for running without an argon purge







Overlay of spectra taken over 8 hours using Neon correction

- The wavelength reference section of the detector monitors a small portion of the neon spectrum in order to create a dynamic wavelength scale used to actively correct wavelength positions.
- The resultant wavelength accuracy and reproducibility allows direct ‘on-peak’ measurements

Reduced running costs.

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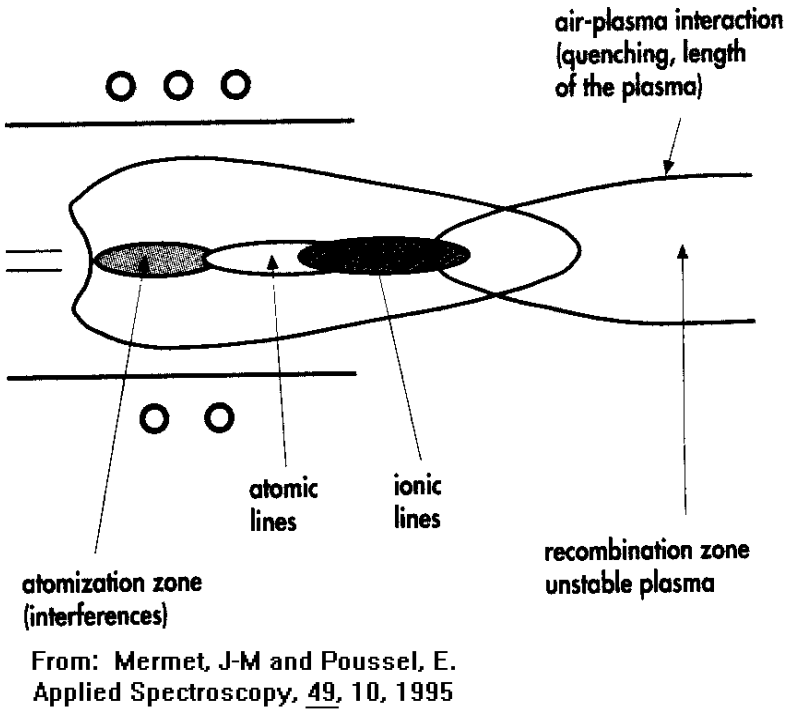
Anatomy of the plasma



From: Mermet, J-M and Poussel, E.
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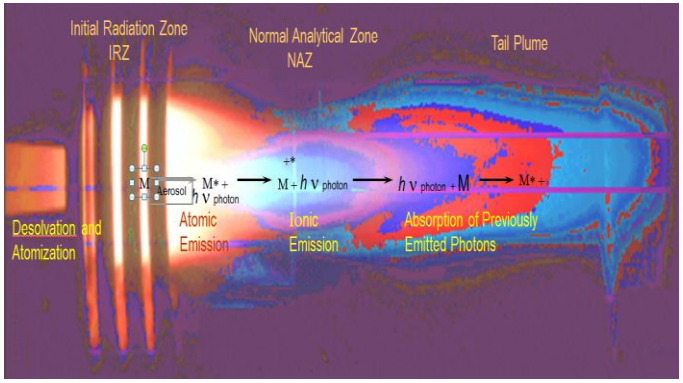

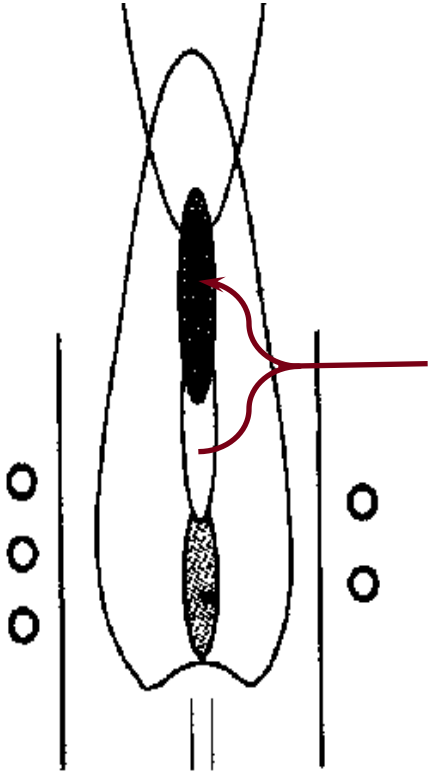

With radial viewing, we are mainly focusing onto atomic and ionic zones. The cold zone is not seen, so less potential interferences, and no influence of the plasma tail on the performances

A plasma has 4 zones : the basement cold zone is the location of potential interferences, the atomic zone, less cold, where atomic lines are located (i.e. alkalines), the ionic hot zone, where a maximum of lines are located and a complex zone, at the top, including plasma tail where interactions air/plasma are located with recombination

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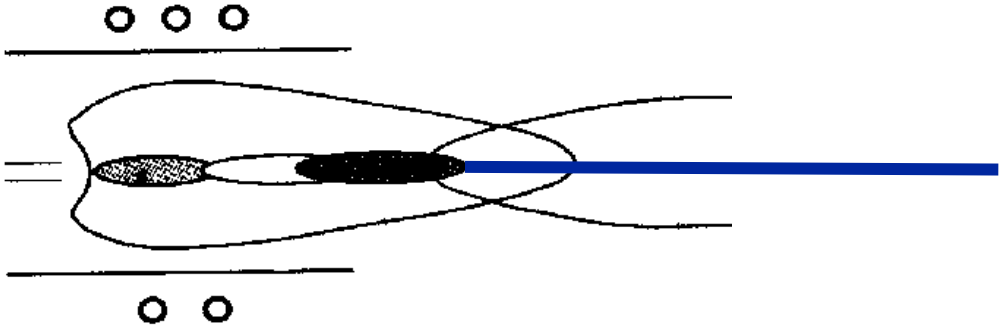
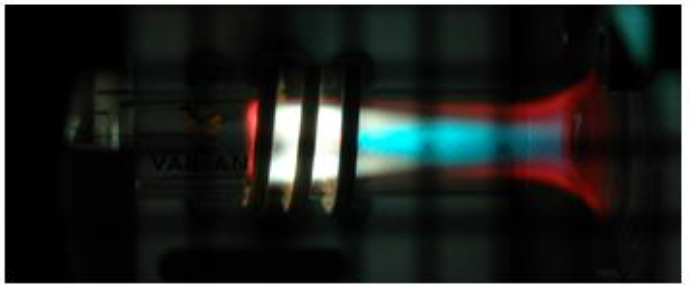
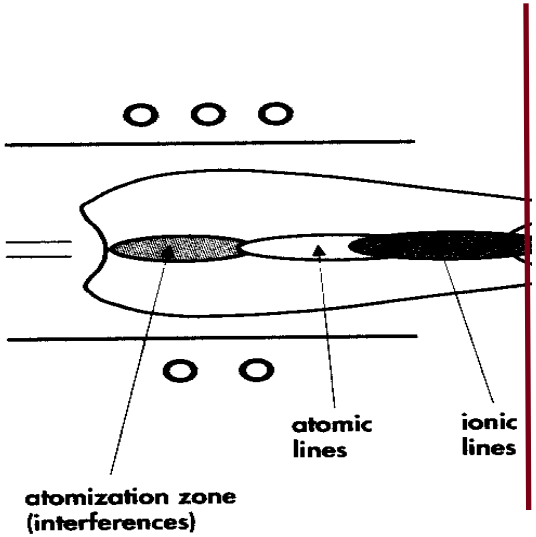
Anatomy of the plasma





Optical entrance positioning

In axial viewing, the mounting is made to facilitate the direct observation (no or less possible mirrors, but it is impossible to only focus into the zone without interference



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The plasma tail is easy removed using a ceramic « nose » , a shear gas (PE) or a cold large cone . This action minimizes the maximum of interferences in this zone

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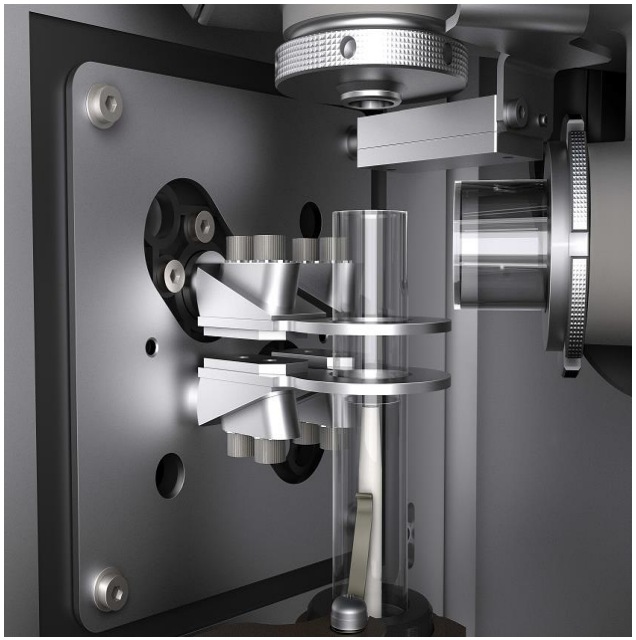
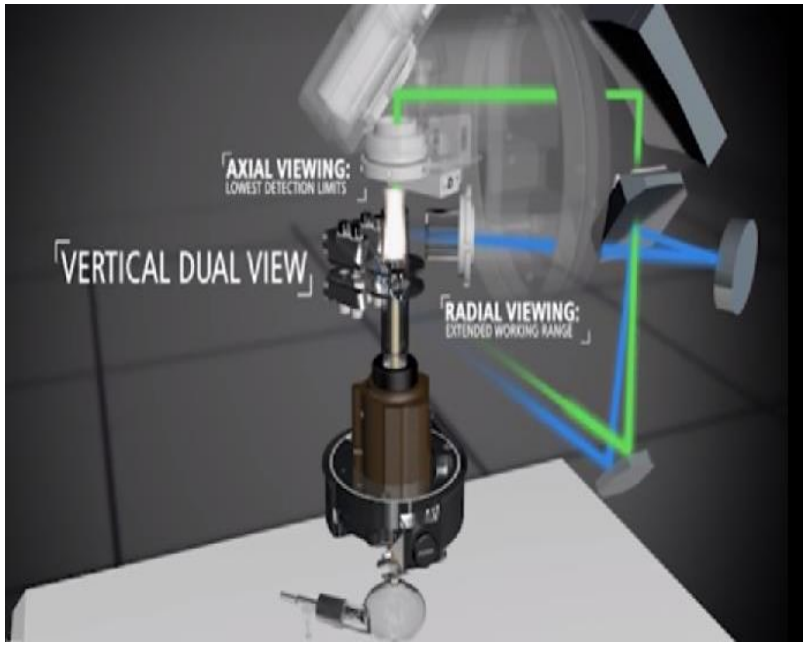
Vertical Dual View

- Vertically mounted plasma

- Axial view above plasma, vertically
- Radial view side on, horizontally





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OPTIMA DUAL VIEW

Dual View Advantages

- No need to rerun samples because of sample concentration
- All data, both axial and radial on one report
- Determine ultratrace and percentage levels at best wavelength without the need to find a suitable, interference free, alternate wavelength
- Method development time decreased dramatically.
- Reduced sample prep, dilutions, buffers, etc.

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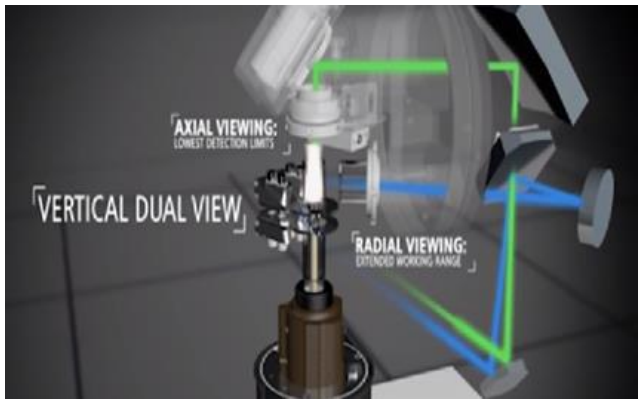
Vertical dual view



- Avio 200 has 4 measurement modes :
  - Axial
  - Radial
  - **Attenuated axial**
  - **Attenuated radial**

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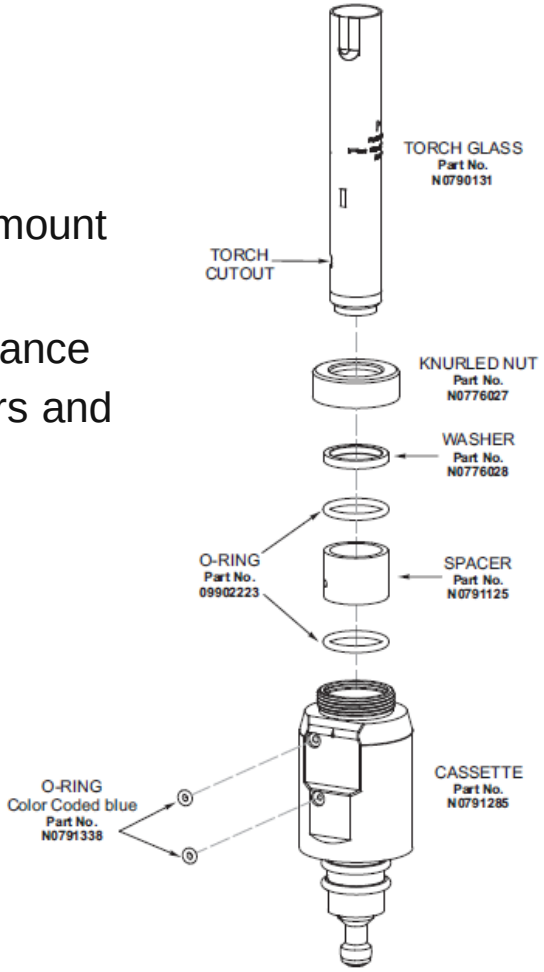
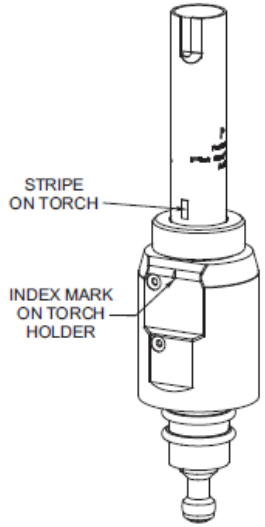
Closer view of Avio 200 Vertical Dual View

Matrix Flexibility

- Vertical plasma with quick-change torch mount
  - Quick, easy, tool-free adjustment
  - Removable injector for easy maintenance
  - Compatibility with variety of nebulizers and spray chambers
  - LED lights in the torch compartment





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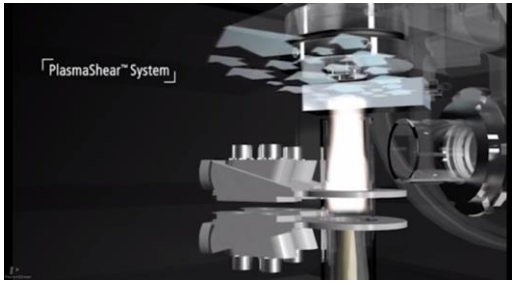
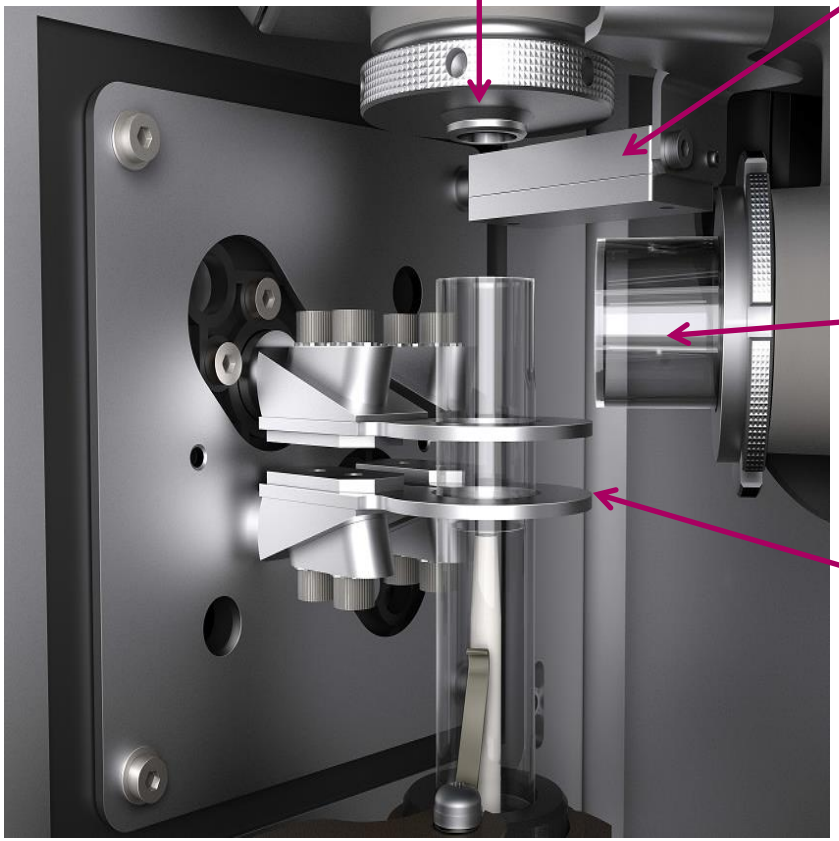
Closer view of Avio 200 Vertical Dual View

- Flat plates –
  - low gas usage
- Plasma Shear –
  - No maintenance
  - Cools torch box
  - Directs tail plume and heat away from axial viewing mirror
  - Axial window is protected, no contact with the plasma





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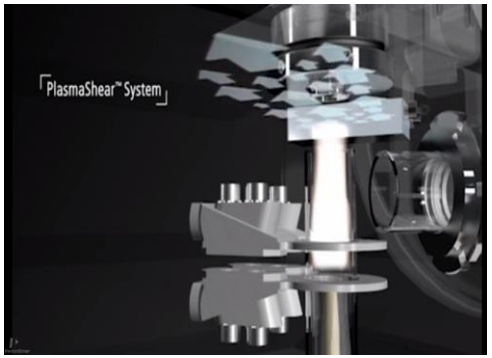
Advantages of the PlasmaShear



Benefits of PlasmaShear

- Increases the Dynamic Range of Axial View
- No maintenance
- No consumables to replace
- Uses compressed air and no argon Avoid contaminations (no cone contact)
- Removes heat transfer to optical system
- No need for additional argon consumption
- Maintains performance without compromise
- Doesn’t affect sensitivity, even in radial orientation

Typical integration times 0.1 – 2 seconds

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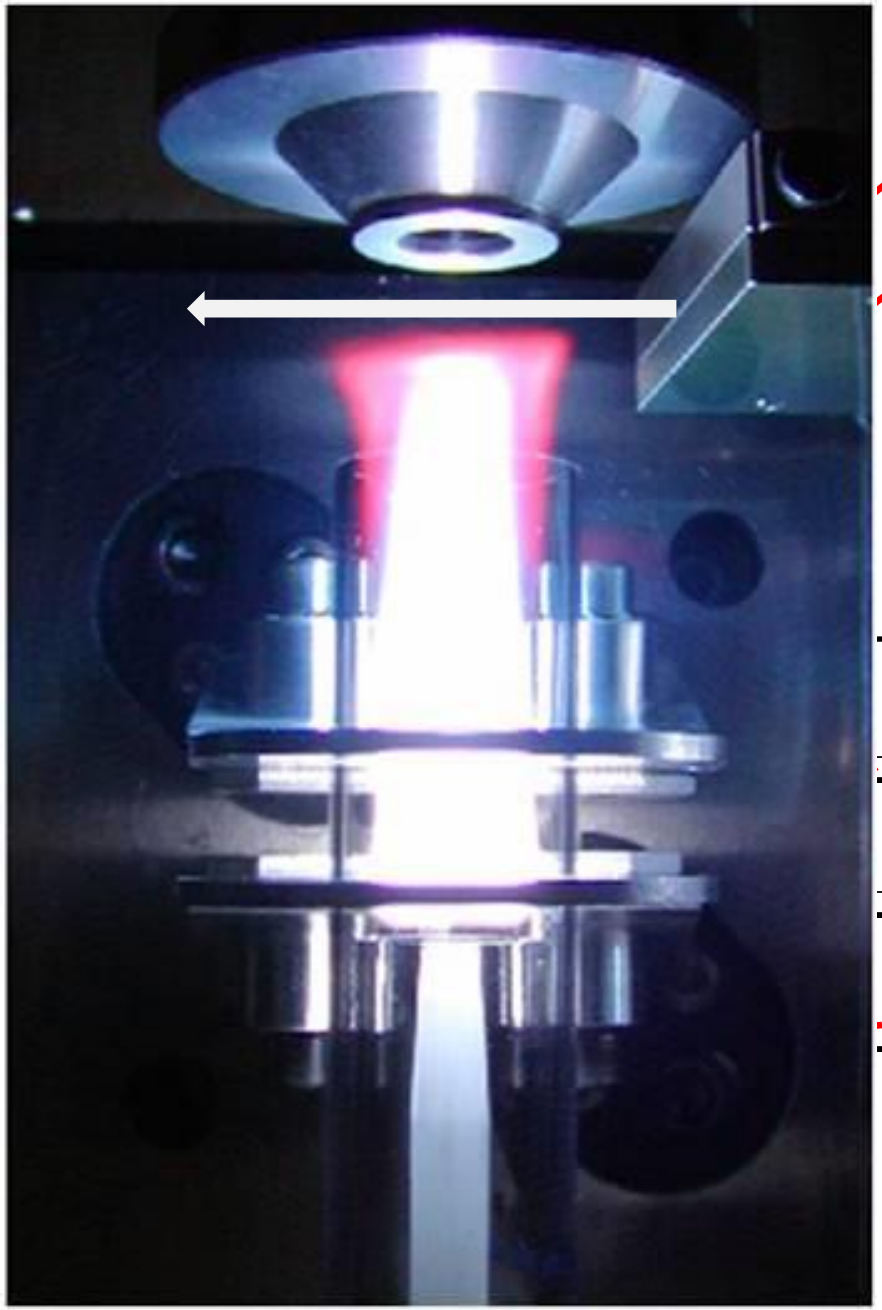
The PerkinElmer Plasmashear gas

- The axial window is protected, no contact with the plasma, no consumables, no thermal transfer to optics
- Excellent observation of the emission lines into the heart of the NAZ (Normal Analytical Zone) from the plasma



- For the axial viewing, the gas cuts the plasma tail
- Gas = compressed air
- Exhaust is also playing a role to eliminate the heat

- Reverse Argon flow of typically 3l/min or more
- Screws to remove for cleaning procedure
- Cone Interface must be cooled by water coils

- "Cone" Interface small hole for light
- Material Build-up on Cone
- Direct contact with Plasma's heat – full thermal transfer to optical system

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What does a small size mean for extraction?

- Traditionally – smaller instruments need higher extraction to compensate

- Competitor A = 171 CFM (290 m3/h)
- Competitor B = 212 CFM (360 m3/h)

- Avio 200 = 120 CFM (203 m3/h)

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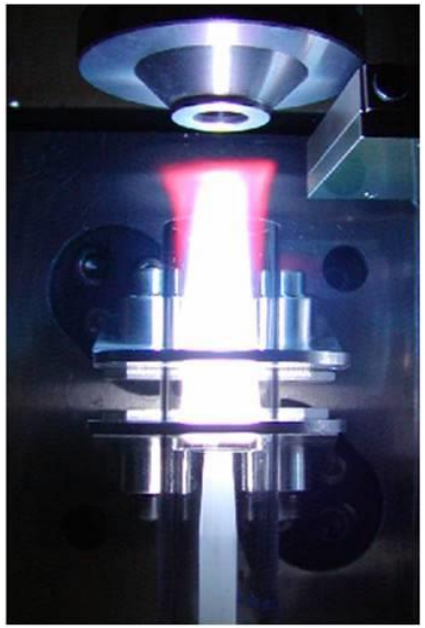
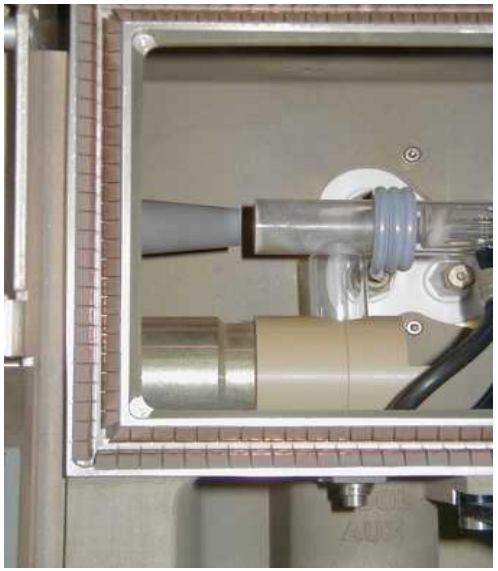
Different Dual View approach

Plasmashear the best choice



- Performances, less cost
- Torch stays clean
- Window(s) stay(s) clean
- Organics without difficulty with DV

ceramic nose

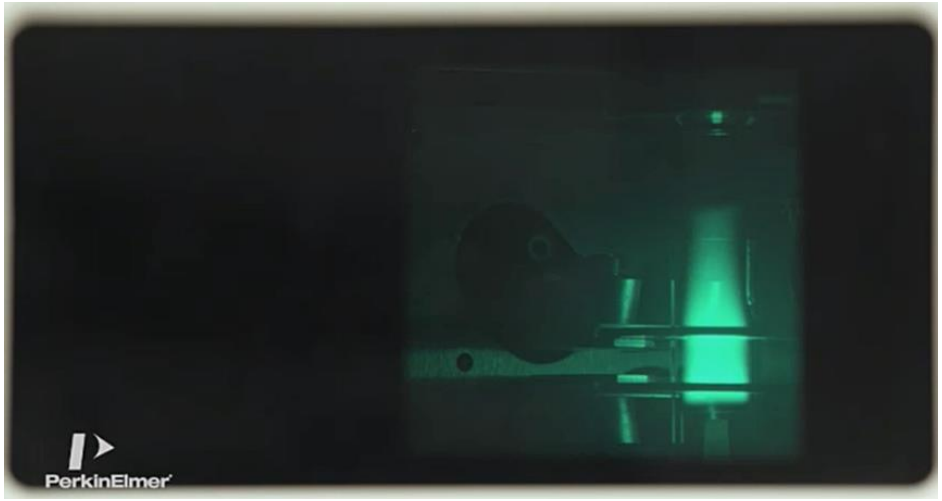


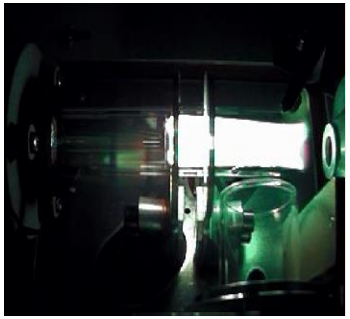
- Torch quicky dirty
- Large O'ring around the axial window, cannot allow frequent maintenance
- Organics difficult with Duo
- More maintenance, higher cost
- NO Vertical Torch

cones, the worst solution

- Deposits on cones, torch, window
- Need of an additional argon flow min 3L/min
- More maintenance , really expansive

PlasmaCam lets you see it all





Continuous viewing of the plasma:

- Simplifies method development
- Enables remote visual diagnostics
- Ensures maximum up time
- Teaching tool

See plasma, torch and injector clearly

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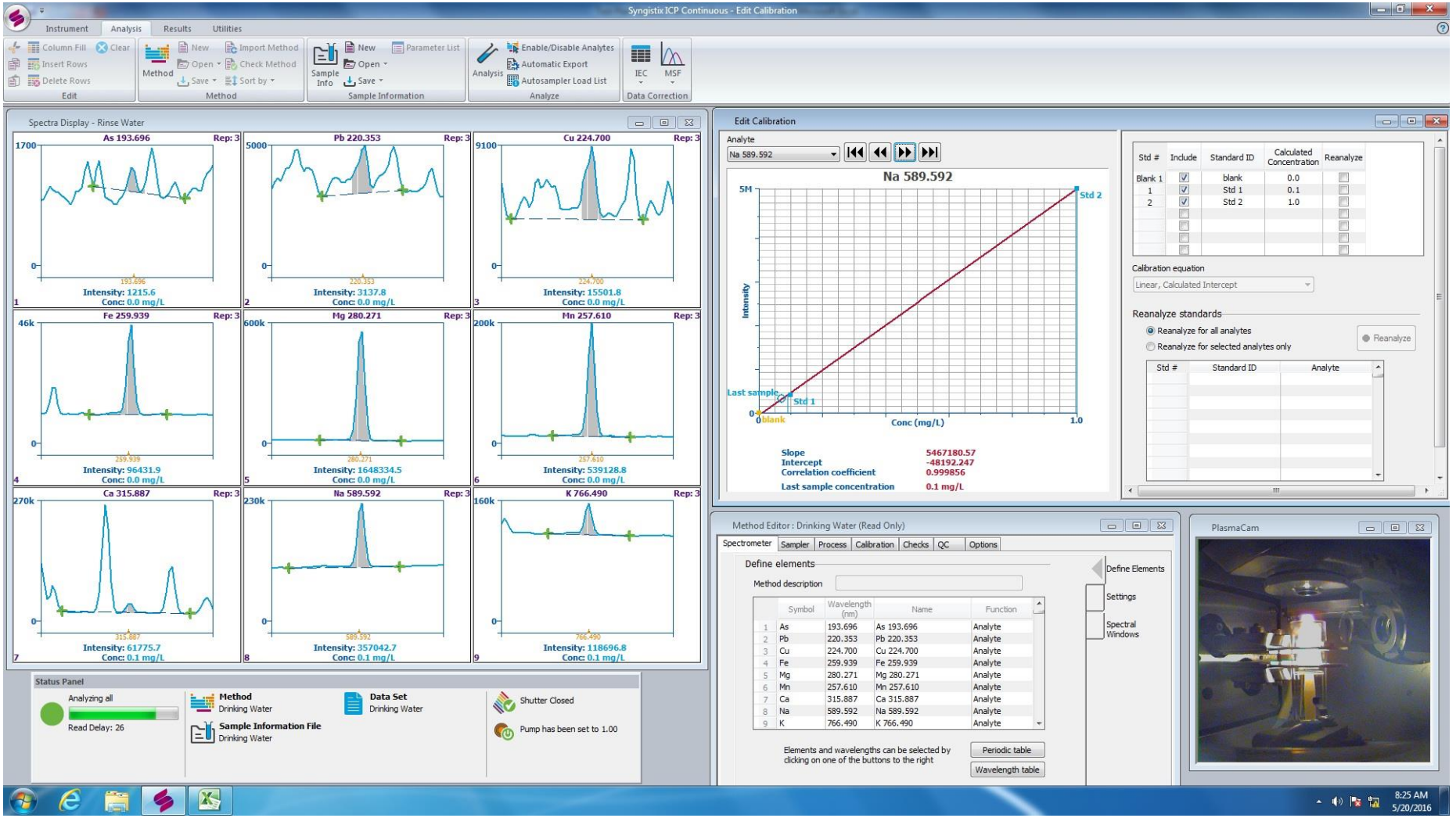
Syngistix for ICP – Version 2.0



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