



ThermoFisher
S C I E N T I F I C

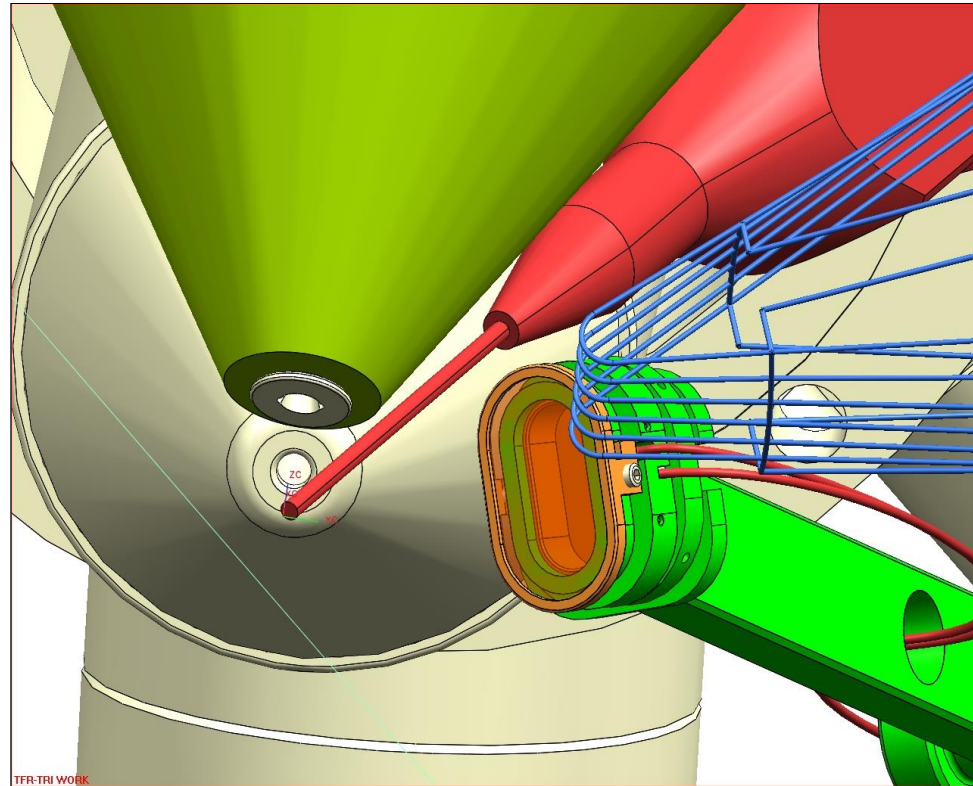
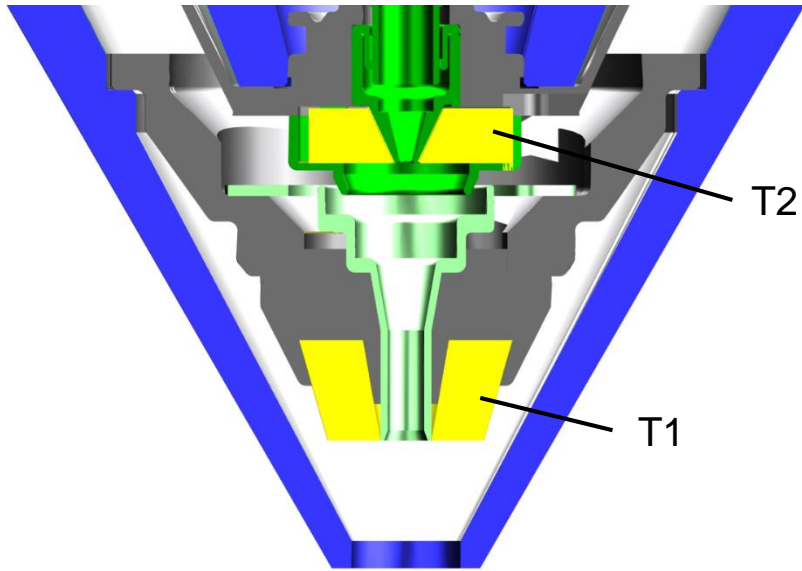
Scios Detectors

Module 8

Detectors that come standard with the ordered Scios:

- Everhart Thornley Detector = SED for High Vacuum mode
- T1 + T2 (embedded in end lens)
- **LVSED = SE detector for low vac mode**
- IR CCD camera

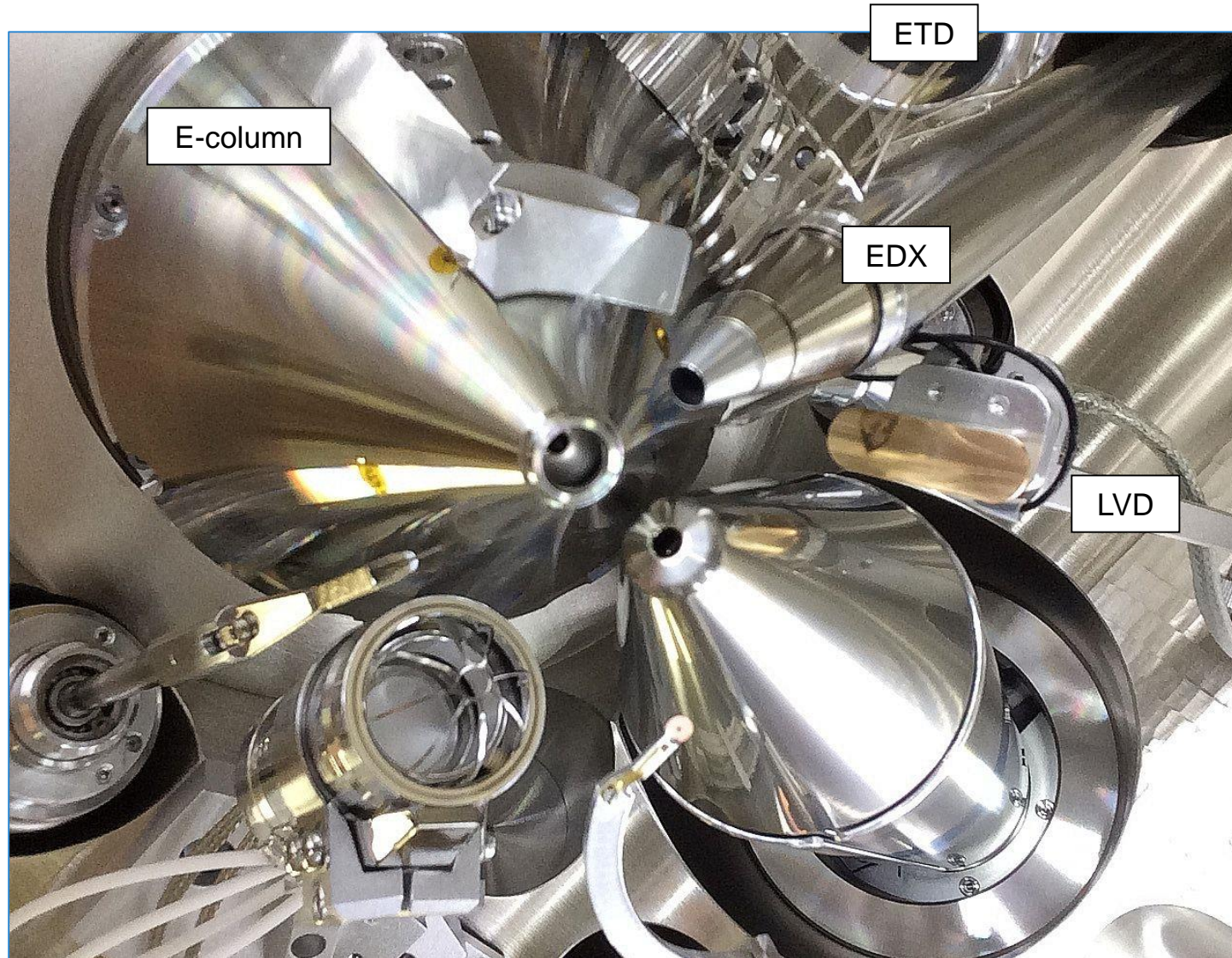
Scios Standard detectors



ETD (SED High Vac) is permanently mounted in the chamber.

LVSED (SED Low Vac) is permanently mounted in the chamber.

Scios Hivac and Lovac



Standard detectors: CCD Camera

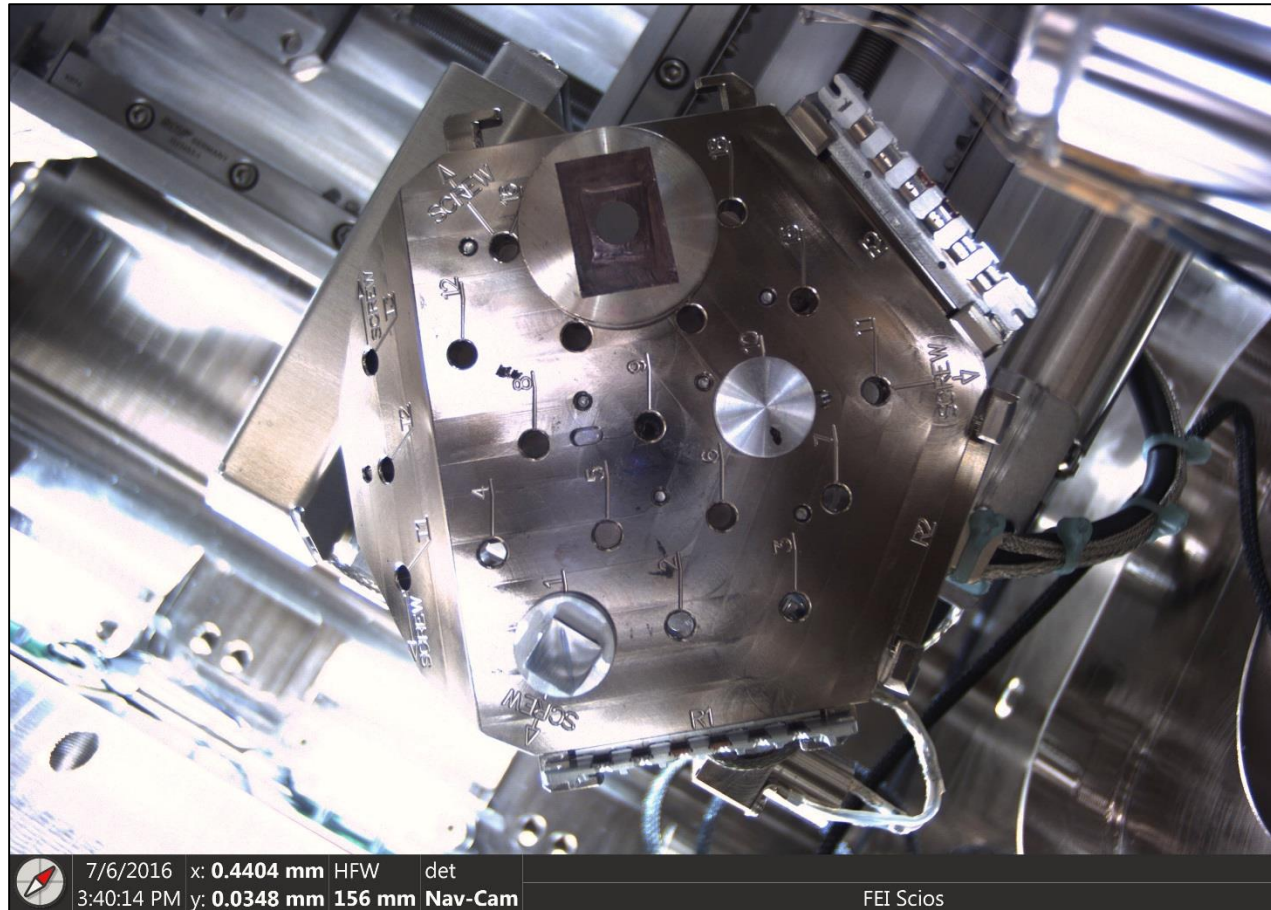


Optional detectors

- Navigation Camera = full color image of sample (holder) can be made for easy navigation/correlation
- Retractable DBS = (low kV) back-scatter detector [[Hivac/Lowvac mode](#)]
- Retractable STEM 3/STEM 3+ detector [[Hivac/Lowvac mode](#)]
- T3 (In Column Detector) = surface sensitive info [[Hivac](#)]
[Low energy SE detection in combination with OptiPlan and or Beam Deceleration mode](#)
- ICE = Ion Conversion and electron detector [[Hivac mode](#)]: SE or SI detection
- GAD (Gaseous Analytical Detector) = lovac BSED [[Lowvac mode](#)]

- Analytical detectors....

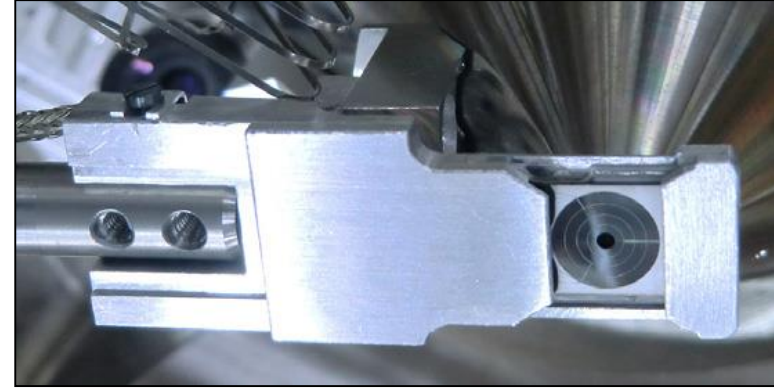
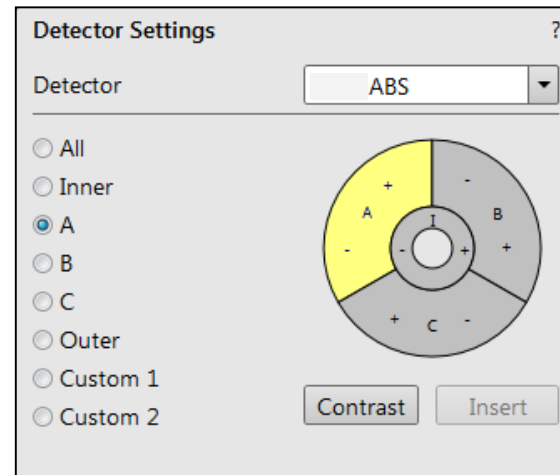
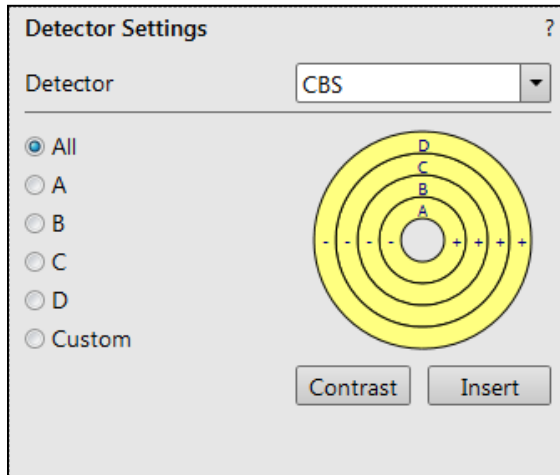
Optional Detector: Navigation Camera



NavCam image of Multi Purpose Holder

Optional Detector: Retractable DBS

DBS can be configured in 2 ways:
CBS = concentric backscatter detector
or
ABS = angular backscatter detector



tilt restrictions using large holder

Optional Detector: Retractable DBS: Scios 2



tilt restrictions using large holder

Sample Exchange

Working Folder

Root: \\ANNP-SCIOS2-SPC\SharedData\@Ellen\...
Create Subfolders for Displays: Off
Edit...

Chamber

Pump Vent

Sample Cleaning - + 5 min

High Vacuum
 Low Vacuum Water

Chamber Pressure - + 0.40 mbar

Take Nav-Cam Photo Purge

Holder

Other Accessory **Multipurpose Holder** Single Stub Holder

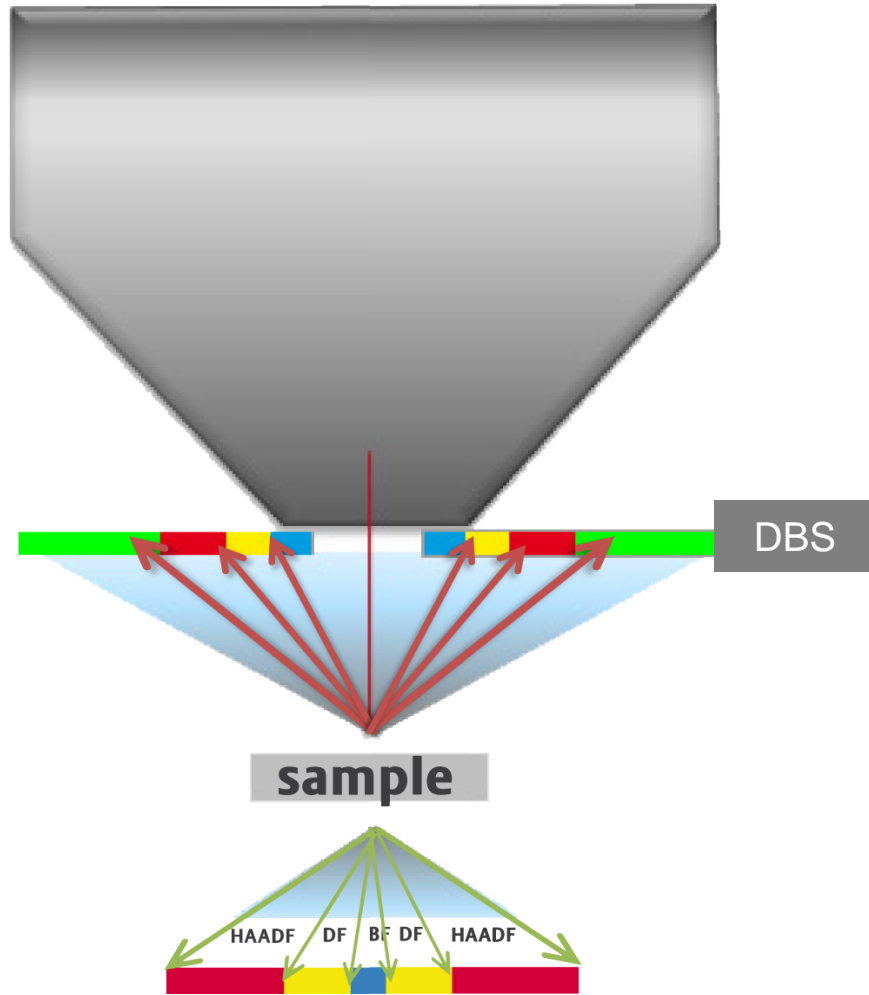
System

Wake Up Sleep



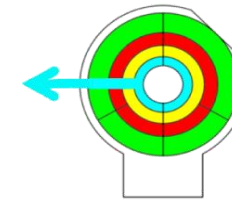
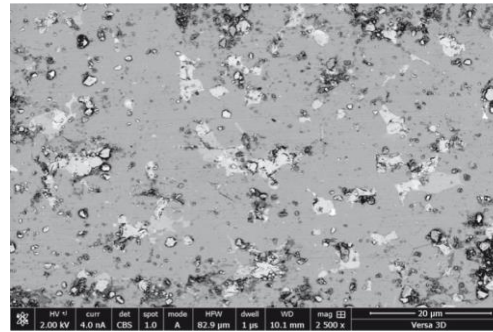
choosing single stub holder;
sw restrictions are disabled

Optional Detector: Retractable DBS



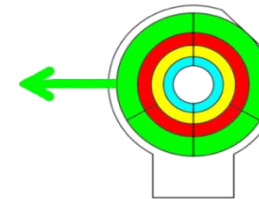
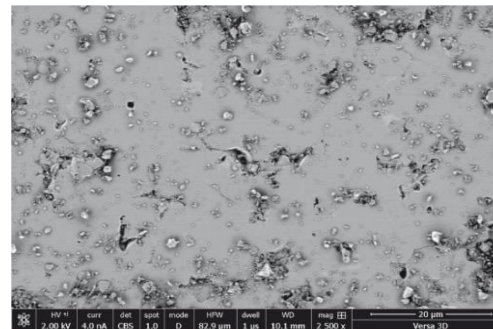
The Directional Backscatter Electron detector* (DBS) allows collection of surface or compositional information through a Concentric Backscatter mode (CBS) to filter signal from various angles (which can be selected by segment, working distance and/or Beam Deceleration*). A range of angles can be precisely selected based on imaging conditions to reveal unique information.

Composition and material contrast



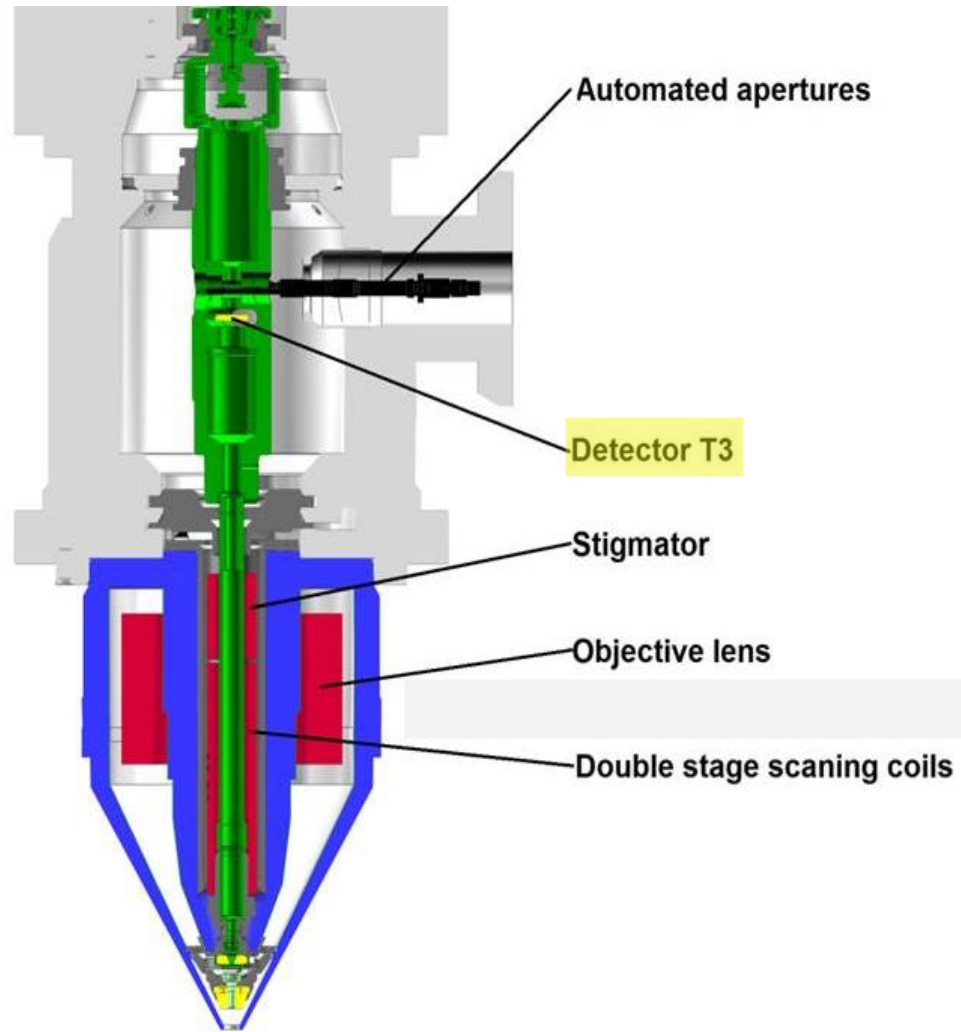
Inner rings collect signal on-axis with the primary beam which contains most channeling or atomic contrast information.

Surface information and topographic contrast

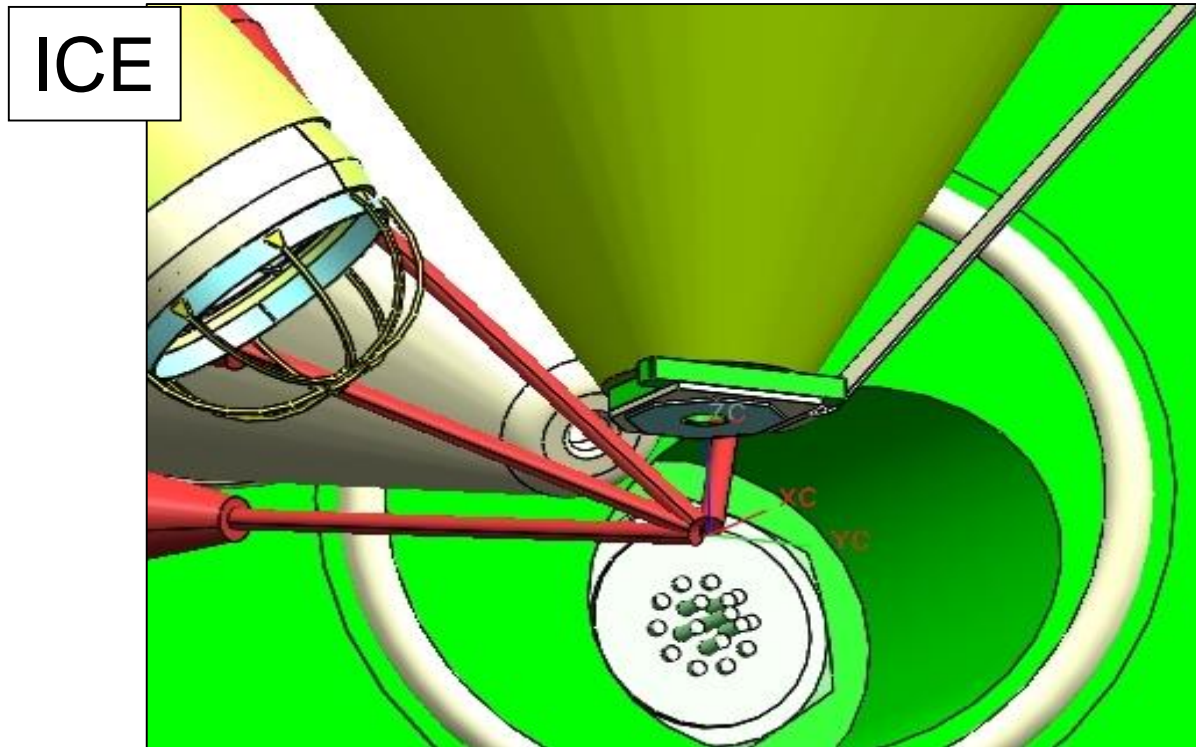


Outer rings collect large angle BSE signal, containing mostly topographic information.

Optional Detector: T3 (In-column detector)



NOTE: T3 not retractable on Scios 2

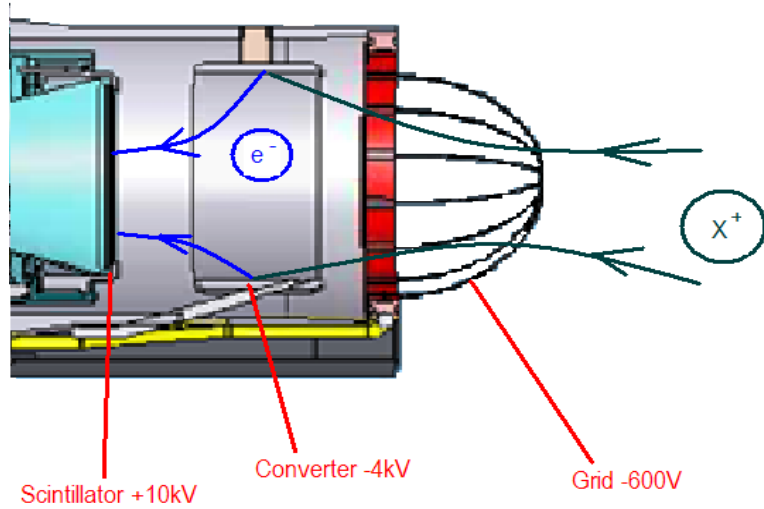


ICE = Ion conversion and Electron detector

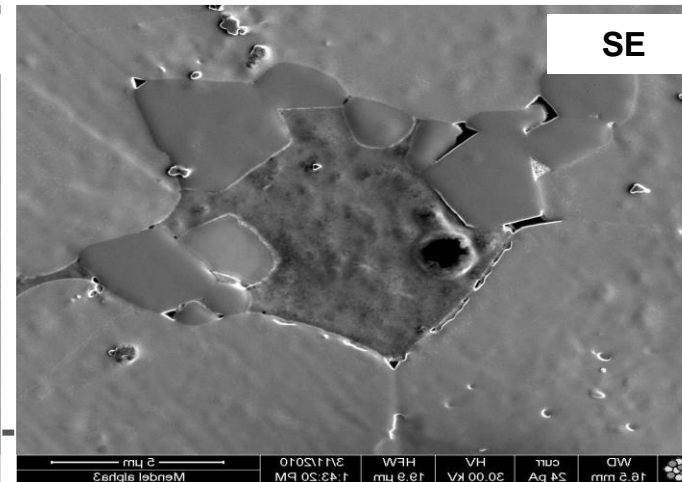
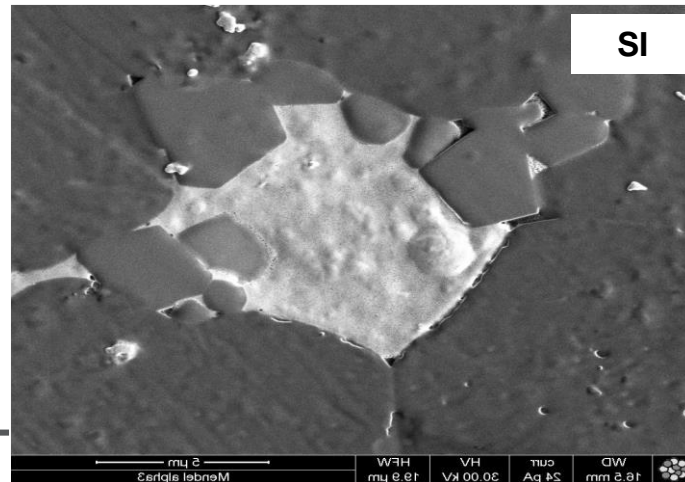
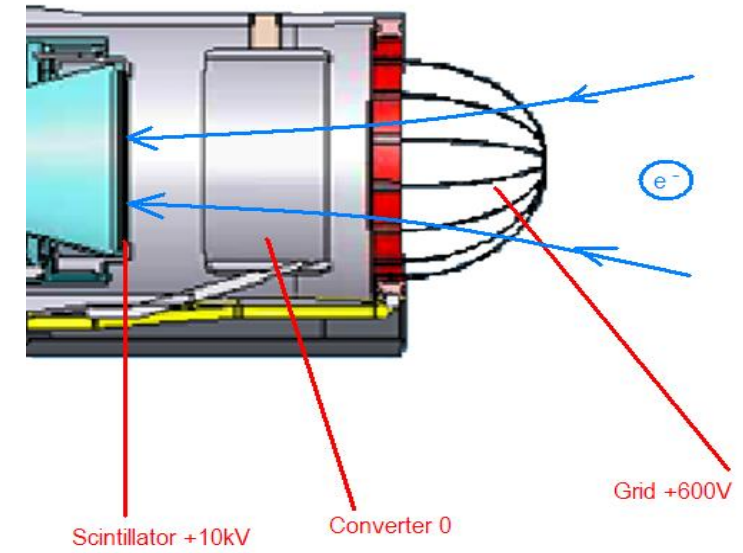
- FIB imaging: SI (material contrast) or SE (topography)
- SEM imaging: SE

Optional Detectors: ICE detector – working principle

Secondary ion mode

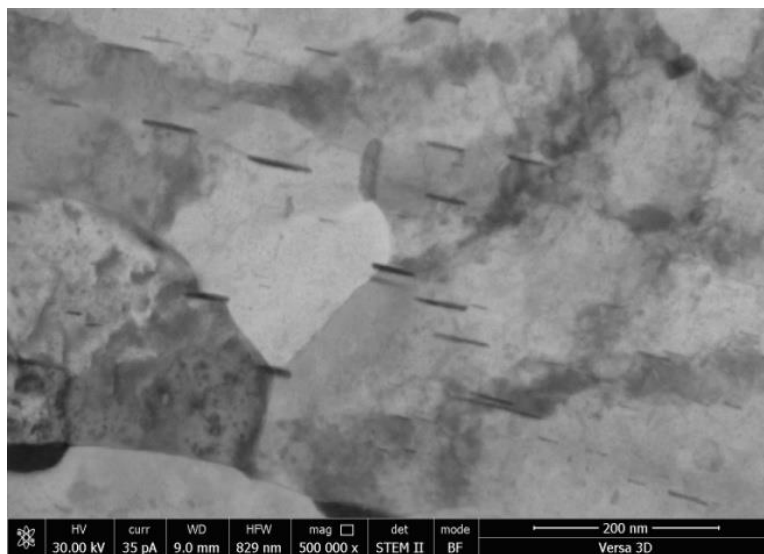


Secondary electron mode

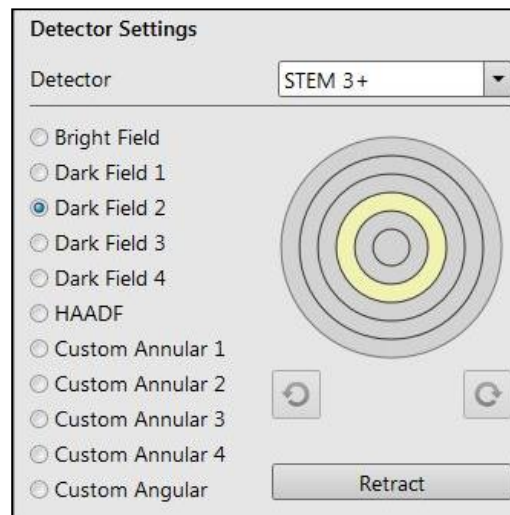


Optional Detector: Retractable STEM 3+ / STEM 3

- High resolution imaging and high resolution EDS analysis
- 14-segment STEM detector for transmission imaging in bright field, dark field and high-angle (annular) dark field.



Bright field (BF) STEM image of Aluminum showing precipitates of 2nm (width)

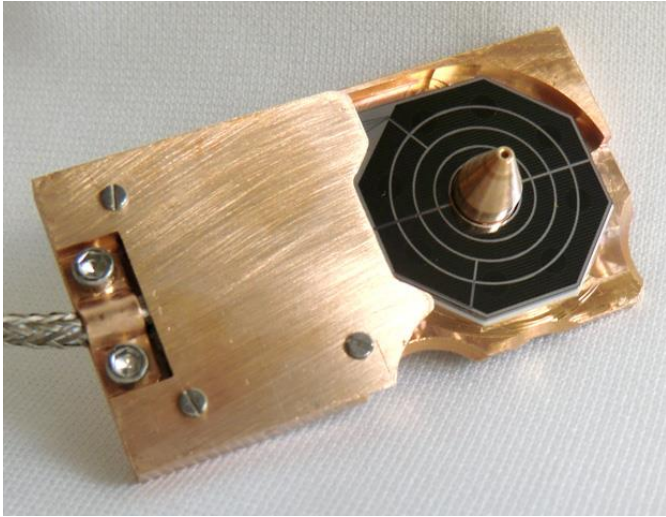


Selection of active segments in the UI.

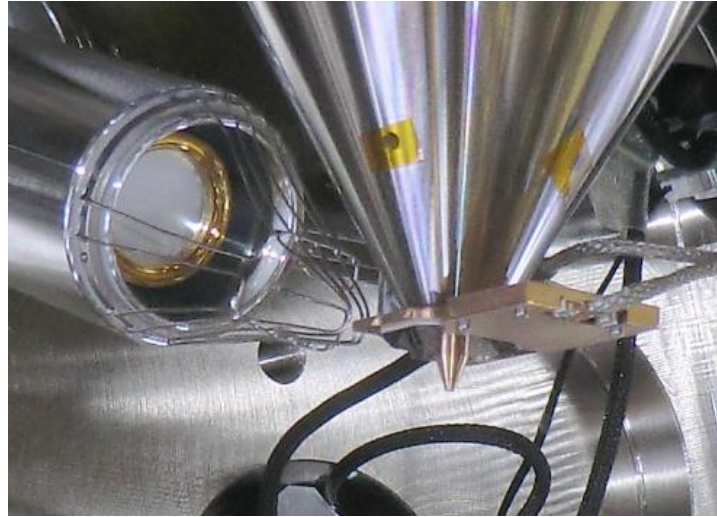


No TEM grid manipulation; the samples are made and imaged without manipulating sample or breaking the vacuum

Optional Detectors: Gaseous Analytical Detector (GAD) for Lovac mode



Lens mounted (directional) GAD



Standard LVD (SE detector)