

# Auto Slice and View 4 Software

## Multi-modal 3D data collection from DualBeam instruments

Auto Slice and View 4 software allows for automated acquisition of high-resolution 3D images and analytical maps (EBSD, EDS). It acquires data by milling serial sections (slices) and then imaging and/or mapping each slice of a user-defined region of interest of the sample.

Due to the destructive nature of FIB cross sectioning, it is important to collect as much information from the sample as possible. Thermo Scientific™ Auto Slice and View™ 4 software enables acquisition of multiple imaging and analysis modalities on every slice. This includes information such as materials and channeling contrast generated by multiple detectors for SEM and FIB. In addition, elemental information can be collected by EDS (using different conditions than those used to image), and grain orientation/strain texture analysis can be provided by EBSD mapping.

Auto Slice and View 4 software has drastically enhanced the flexibility of acquisition. In many cases, the relevant content of a sample is revealed only during cross sectioning. It provides necessary features to adjust the cross section job during the run. Define new imaging acquisitions, adjust or modify existing regions of interest, or adjust or define new analytical mappings during the run.

Visualizing and understanding the content of the cross section is the ultimate goal of any slice and view job. Cut placement accuracy and slice thickness uniformity are critical components in the transition from cross sectional raw data to meaningful information. Auto Slice and View 4 software implements improved machine vision algorithms that utilize edge-based techniques to ensure that slice thicknesses as low as 3 nm can be achieved. Auto Slice and View 4 software has enhanced its workflow with FEI Avizo™ for Materials Science software, providing you with the fastest path from raw data to advanced 3D reconstructions and visualization.

### Key Benefits

**Integrates SEM and FIB imaging**, EBSD and EDS mapping into one package

**Intuitive, easy to use UI** with streamlined workflows

**Acquire all the information on every slice** (imaging, analytics, current, voltage, tilt, etc.)

**On-the-fly editing capabilities**

**Digital tilt-shift compensation** to improve collection efficiency

**Highly flexible and reliable acquisition** with precise and repeatable cut placement

**High speed and throughput** with multi-site capability

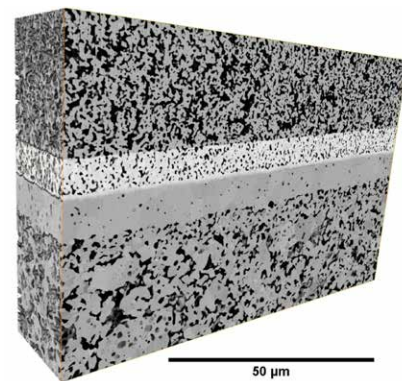


Figure 1. All layers of a Solid Oxide Fuel Cell, collected with Helios PFIB DualBeam and Auto Slice and View 4 software in a single run. 3D reconstruction and visualization was done using Avizo for Materials Science software. *Sample courtesy: Jochen Joos et al., Karlsruhe Institute of Technology.*

Sample processing throughput has also improved in Auto Slice and View 4 software by allowing the user to focus on and acquire only the information that is needed. By defining multiple areas of interest on the cross-section cut face, only those relevant areas are imaged. Similarly, it is possible to collect staggered information e.g. acquiring a BSE image on every slice but only acquire an EBSD map on every fifth slice. This methodology means that only the necessary information is acquired with huge time saving.

Auto Slice and View 4 software introduces an advanced, intuitive user interface that better utilizes the available screen space to help you accurately define volumes and view jobs. This version also includes a capability to create a new project by using any of the existing projects as a template. This process simplifies common slice and view activities and provides a mechanism for you to standardize such jobs in your lab.

Key Feature	Included
Autofocus	✓
Drift correction	✓
Data review	✓
Region of interest imaging	✓
Multi-detector acquisition	✓
SmartScan advanced scanning strategies	✓
Process tracking	✓
Optimized imaging conditions (stage shuttling)	✓
8- or 16-bit image acquisition	✓
Multi-site acquisition	✓
Edit running projects on-the-fly	✓
Every n-slice acquisition	✓
Edge based cut placement	✓
Digital Y-shift compensation	✓
Arbitrary angle milling	✓
Rocking mill support	✓
EDS and EBSD data acquisition (optional)	✓

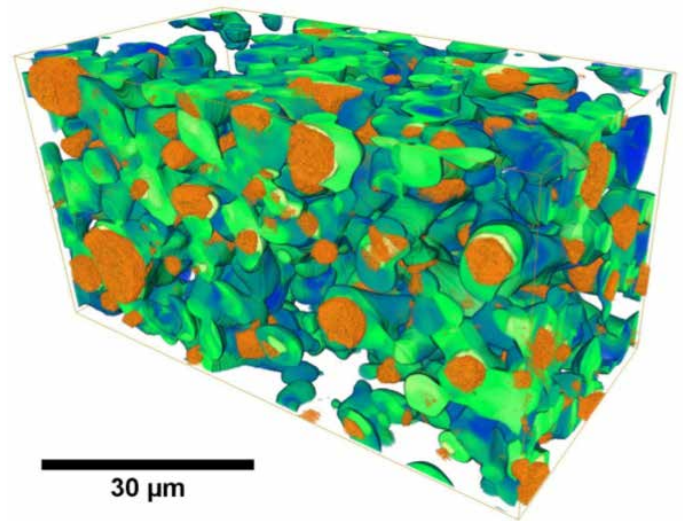


Figure 2. 3D reconstruction of W-Mo-Cu sample using a combination of BSE (green-blue) and EDS (orange) data, which has been produced with a Thermo Scientific Scios™ 2 DualBeam™ System, Auto Slice and View 4 and Avizo for Materials Science software.

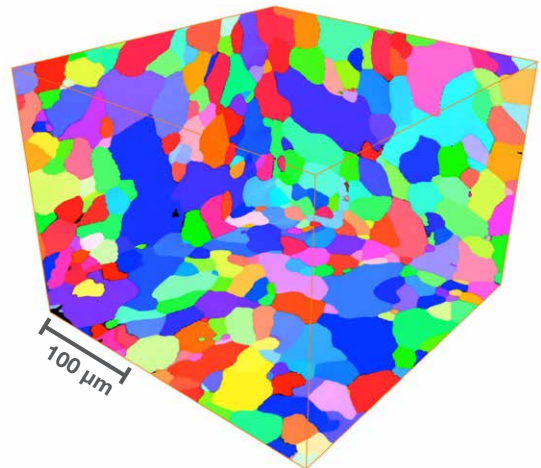


Figure 3. 3D EBSD reconstruction of Zircalloy sample ( $250 \times 250 \times 220 \mu\text{m}^3$ ) produced with Helios G4 PFIB DualBeam, Auto Slice and View 4 and Avizo for Materials Science software.

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