Multi Beam System

Scientific / Metrology Instrument

JIB-4700F

Toward Seamless Observation and Analysis

Enabling seamless observation and analysis

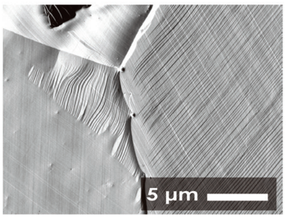
Greatly improved SEM imaging by a new optical column.
Further strengthened FIB processing capabilities.
Improved operability with linkage capabilities.

SEM:
Improved imaging performance by a new optical column

- High resolution at low accelerating voltage: 1.6 nm at 1 kV
- Acquisition of various images: In-lens detectors added
- High resolution at large probe current
- Large depth of focus (LDF) at low magnification

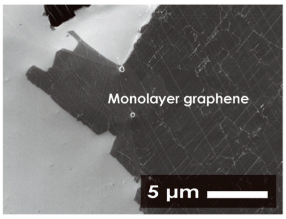
Applications of LED / USD / UED

Figures below are SEM images of a monolayer graphene grown on Ni, acquired simultaneously with three detectors. The USD (upper secondary electron detector) clearly reveals the existence of the monolayer graphene.



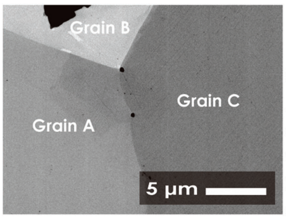
LED

Topographic information on the specimen is captured at a short WD. The coincident WD is suitable for secondary electron imaging of FIB-prepared cross section.



USD

Low-energy secondary electrons can mainly be detected. These electrons are very sensitive to the surface states. USD enables observation of the difference of the top-surface state.



UED

An energy filter is placed at the front of the detector, so as to preferentially acquire a variety of information. You can observe a backscattered electron compositional image at low accelerating voltages.

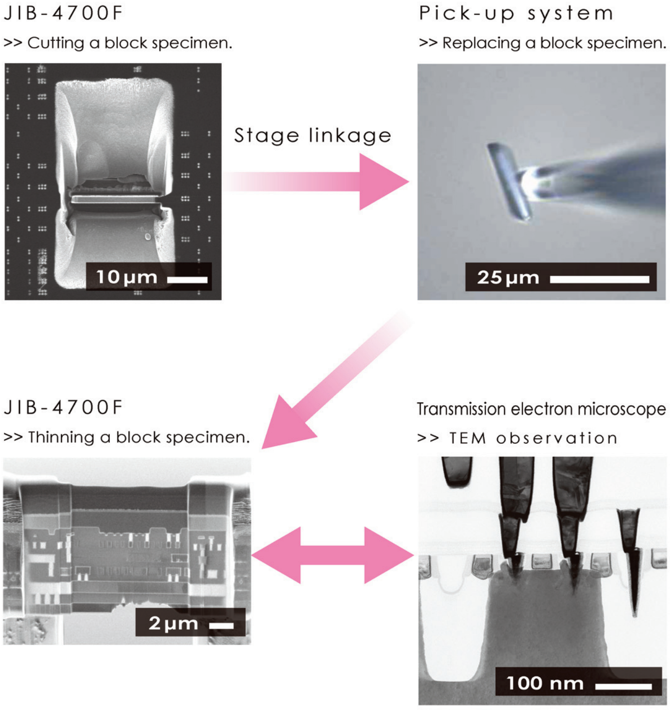
Accelerating voltage:1.5 kV,
Specimen courtesy: Professor Yoshikazu Homma, Tokyo University of Science

FIB:
Further strengthened processing capabilities

- Enhanced control system: Smooth processing of an arbitrary shape
- Large ion beam current up to 90 nA: High-speed processing
- Linkage with pick-up system: Sharing the linked coordinates

Bulk pick-up method

In Bulk pick-up method, a thick block specimen prepared by FIB is mounted on a grid with an ex-situ pick-up system. Then, thin film processing is made by FIB. This method enables you to perform various processing, including thin film preparation of a magnetic material, re-processing after TEM observation, thin film preparation from a different direction (from bottom of specimen, etc.) and cross-sectional or planar milling.



SCAN d.o.o., Preddvor
Nazorjeva 3 · SI-4000 Kranj
Phone +386-4-2750200
www.scan.si · info@scan.si

Multi-purpose Electron Microscope

Scientific / Metrology Instrument

JEM-F200

Smart design:

Design concept "Smart" focused on a user interface for intuitive operation.

Quad-Lens condenser system:

New illumination system to
independently control electron-beam intensity and convergence angle.

Advanced Scan system:

Incorporating a De-Scan system in the imaging lens system(optional)

Pico Stage Drive:

Field-of-view can smoothly move in steps of the "pm" order.

SPECPORTER™ (automatic holder insertion & retraction):

Enables smoother holder insertion & retraction by simply pushing a button.

Improved Cold FEG:

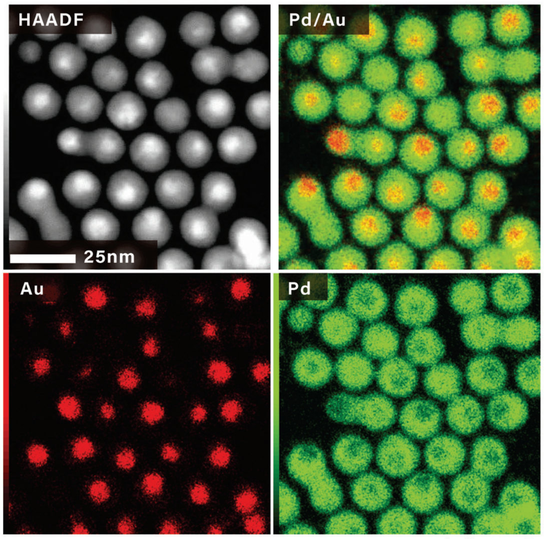
Cold field emission gun (Cold FEG: optional) producing a high-stability, high-brightness electron beam for high energy-resolution EELS.

Dual SDD:

Two large-solid angle, high-sensitivity silicon drift detectors (SDDs: optional) can simultaneously be installed

Environmental friendly:

Standard ECO mode system saves energy efficiently
when the microscope is not used.



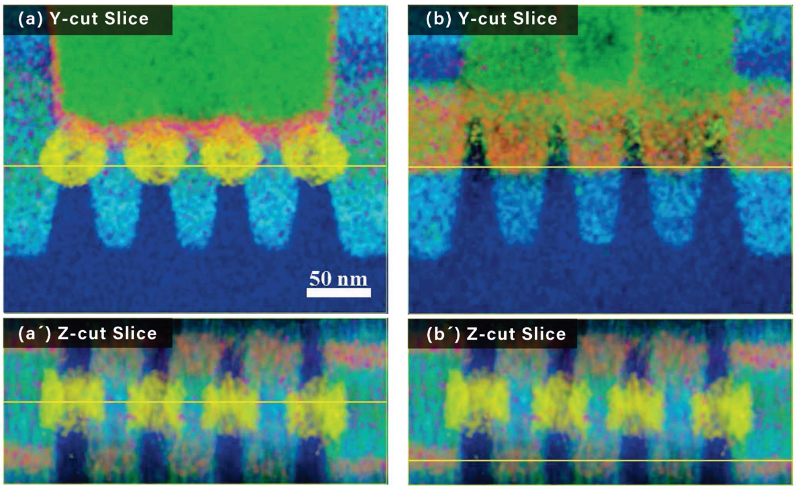
512 × 512 pixel, ~5 min

Data courtesy : Prof. A. I. Kirkland
Oxford University

Specimen courtesy : Dr. R. D. Tilley and Dr. Anna Henning
Victoria University of Wellington

Fig. 1. Elemental maps of core-shell structured catalyst particles

Since Dual SDD has high detection efficiency, you can rapidly acquire clear elemental distributions even from a catalyst specimen susceptible to electron-beam damage, as shown in Fig. 1 (Au core region and Pd shell region).



Reconstruction Technique: SIRT (Simultaneous Iterative Reconstruction Technique) *

* SIRT is an effective technique to reconstruct EDS tomography because the influence from missing wedge or noise is very small.

Fig. 2. 3D elemental maps of semiconductor specimen

Shorter acquisition time of Dual SDD enables 3D tilt-series elemental maps to be obtained from FinFET by EDS tomography. Fig. 2 shows detailed results.Y-cut and Z-cut slice maps extracted from 3D elemental maps of FinFET using EDS tomography are shown. (a) and (b) show elemental maps of the Y-cut slices at different positions indicated by a yellow line in the corresponding Z-cut maps below. The Z-cut slice is parallel to the wafer surface. Elemental information on the Si/Ge stressor and the Tri-Gate structure in the channel are confirmed.

SCAN d.o.o., Preddvor
Nazorjeva 3 · SI-4000 Kranj
Phone +386-4-2750200
www.scan.si · info@scan.si