EBL-SEM

Device description

The Pioneer Two system in LNQE is a hybrid system for electron beam lithography and scanning electron microscopy (EBL-SEM). It has a maximum acceleration voltage of 30 kV and uses as an electron emitter a thermal field emission (TFE) Schottky-source. The most important parameters are:

- System type: Pioneer Two from Raith
- Beam current: 5pA – 20 nA
- Beam size: < 1,6 nm
- Inlens detector
- Dual-detector for secondary and backscattered electrons
- EDX–detector (Bruker QUANTAX 200) for elements between Z=5 and Z=95
- Nanolitography relsolution: 8 nm
- Pattern generator speed: 6 MHz
- Field stiching und overlayer accuracy: 50 nm (m+3σ)
- Stage travel range: 50 x 50 x 25 mm
- Stage with 360° rotation und 0 – 90°tilt

EBL-SEM – User fees

The research Group Ding (Institute FKP, Dept. ATMOS) is responsible of the EBL-SEM in the LNQE. Its use is subject to a fee. The costs are based on the guidelines of the DFG for the application of usage costs (DFG form 55.04). The DFG distinguishes between usage models:

- "Service operation": The work is carried out by the employees of the Group Ding (FKP-ATMOS).

- "User operation": The users work independently (with less support from the employees of the Group Ding).

Since the Group Ding does not have an employee dedicated only to this device, these different models are currently only of limited use:

- Use of the EBL-SEM in "user operation" is encouraged.

- “User operation” is only possible if an authorized user is involved.

- A person becomes an authorized user only after adequate training and supervision in the correct device operation.

- Students become authorized users first in their PhD research time.

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Billing is based on a “half-day” base (4 hours), the schedule and costs are as following:

Forenoon: 8:30 am – 1.00 pm
Afternoon: 1.00 am – 5.30 pm

Device	Fees (€/hour)		
	User operation	Service operation	Non-academic externals (only Service operation)
SEM (Microscope only)	150.- €	300,- €	750,- €
EDX by day (incl. SEM)	150.- €		
EDX overnight (incl. SEM)	100.- €		
Electron beam lithography	150.- €		

The EBL-SEM is located in the cleanroom of the LNQE. Access to the cleanroom is only possible after consultation with the technical manager, Mr. Oliver Kerker. In addition, the LNQE charges fees for the use of the cleanroom. Please contact the manager director, Dr. Fritz Schulze-Wischeler for more information.

The desired times are booked with Mr. Chenxi Ma (see below for details) maximum 14 days beforehand. The booked time is then published in the online calender of EBL-SEM (https://owa.lnqe.uni-hannover.de/owa) and is since then considered as binding. A booking that has not been canceled at least 3 days in advance leads to the above costs.

In user operation, EBL-SEM users have to prepare their samples themselves.

Please consult the LNQE managers for access to the clean room.

When using the EBL-SEM, the users is required to thank the LNQE and AG Ding in publications, as:

For LNQE: *The Authors would like to thank… "the LNQE and AG Ding for EBL-SEM").*

For the DFG: *The authors gratefully acknowledge the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) under the project INST 187/739-1 FUGG*

After publication, a PDF of the publications must be sent to the LNQE and to AG Ding.

These terms of use are binding for all users.

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