Guidelines to prepare a good proposal for the 10ID-1 Soft X-ray Spectromicroscopy (SM) Beamline

The soft X-ray spectromicroscopy (SM) facility has two endstations, a **S**canning **T**ransmission **X**-ray **M**icroscope (STXM) and a **X**-ray **P**hoto**e**mission **E**lectron **M**icroscope (X-PEEM). Following are some guidelines that will help to write a good proposal.

General guidelines

- If your project requires beamtime for more than one CLS cycle, the objectives for each cycles has to be clearly stated. For example, if your sample is new or if you are developing a novel material and need sample preparation optimization, you should state that during the first cycle, measurements will be made to complete the sample preparation optimization and the second cycle will be used for completing the measurements.

- If your experiment requires special sample holder or setup at the endstations, the details have to be discussed and confirmed with the beamline scientist prior to submitting the proposal.

- In addition to including the scientific track record of the team, the outcome of the proposed experiment if possible has to be stated. For example, the plan to present the results in the conferences and peer-reviewed articles has to be stated. The complementary techniques if used in addition to STXM or PEEM to tackle the scientific problem have to be also stated. This will help to evaluate the scientific merit and success of the beamtime related to the project.

Additional information for STXM proposals

- The requirement to map the elemental and speciation information on a sample at or less than 35 nm spatial resolutions has to be justified in the proposal. Some other techniques like EDX can be used to map the elemental distribution on samples. Therefore, the justification for the STXM access for speciation information has to be stated.

- The number of samples and the type of data (stack, line scans for spectra, and elemental absorption edges) collected per sample for each visit has to be stated clearly. An approximate time of data collection for each sample has to be stated. *You may use the following suggested times, as a rule of thumb to request for beam time. However, it is strongly suggested to add an additional 20% buffer time to complete the experiment.*

    - Sample navigation and locating region of interest per sample = max. 30 min

    - Point spectra: 1 spectra with 185 energy points and 600 ms dwell time ~ 6 min

    - Line scan spectra: 1 line (20 μm with 100 spatial points) with136 energy points and 11 ms dwell time ~ 5 min

    - Stack: 1 region (5 μm × 5 μm with 100 × 100 spatial points) with 81 energy points, and 1 ms dwell time ~ 26 min

Additional information for PEEM proposals

- The requirement to map the elemental and speciation information on a sample at sub-micron spatial scale has to be justified in the proposal.

- If you plan to use the Mercury arc lamp to test a method or to characterize and align the sample before using the synchrotron light, please describe the plan and details in the proposal.

- The number of samples, type of data (stack, image, elemental absorption edges) collected per sample for each visit has to be clearly stated. Please also mention the anticipated data acquisition time for each sample. *You may use the following suggested times, as a rule of thumb to request for beam time. However, it is strongly suggested to add an additional 20% buffer time to complete the experiment.*

No.	Description	Approximate Time range	Comments
1.	Sample mounting on the PEEM holder	25 - 30 minutes	
2.	Sample loading into the load-lock chamber and rough pump using a turbo	30 - 40 minutes	This time estimation is for vacuum compatible samples. If sample is degassing then you should expect more pumping time.
3.	Sample transfer into the main chamber from load-lock, tilt adjustment, rough alignment	45 - 60 minutes	If you are particularly interested in some specific area on the sample to analyze then it takes more time than is generally expected (45 min).
4.	Collecting an NEXAFS image stack (stack is a collection of several images at different energies, near the absorption edge of element of interest, typical range is 25-40 eV	2 – 40 minutes	Data acquisition time depends upon dwell time (time spent to collect data at each energy), and the energy step size (how many energy points you are collecting).
5.	Collecting an X-PEEM image	200 msec - 4 min / image	
6.	1 sample, 1 area, 1 stack 1 sample, 1 area, 3 stacks 1 sample, 3 areas, 3 stacks each area	~ 3 hrs ~ 4 hrs ~ 8 hrs	