Summary / Concluding remarks

European XFEL User Workshop,
University Aarhus, Oct 29-31, 2008

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Scope of the Workshop

The workshop brings together scientists interested in performing experiments on SQS using and developing appropriate instrumentation. √

With the goals …

√ • … to review the areas of application of the SQS instrument,

√ • … to discuss the requirements of the various experimental techniques with respect to x-ray FEL beam delivery and instrumentation and finally

√ • … to initiate activities and collaborations to develop the instrumentation and facilities needed for investigating SQS at the European XFEL.

Areas of scientific application

'New' light-matter interactions

Improve understanding of atomic, molecular, ionic and cluster systems by new experimental techniques

- time-resolved techniques
- scattering to resolve structural features

Investigation of extremely dilute ionic systems

Obviously, this is to be reviewed in the light of future results from FLASH & LCLS

Startup scenario

One SQS instrument prioritized

- emphasis on high intensity
  - ⇒**no monochromator**
  - ⇒**tight focusing optics**
- pump-probe experiments (vis. laser/x-ray)
  - ⇒**optical laser**
- interaction chamber provided by respective users
  - ⇒**no chamber & instrumentation foreseen (similar to FLASH)**
  - ⇒**no specific instrumentation (e.g. an ion beam facility)**

Instrumentation & requirements

Spatial separation of instruments using FEL beam with/without monochromatization was confirmed.

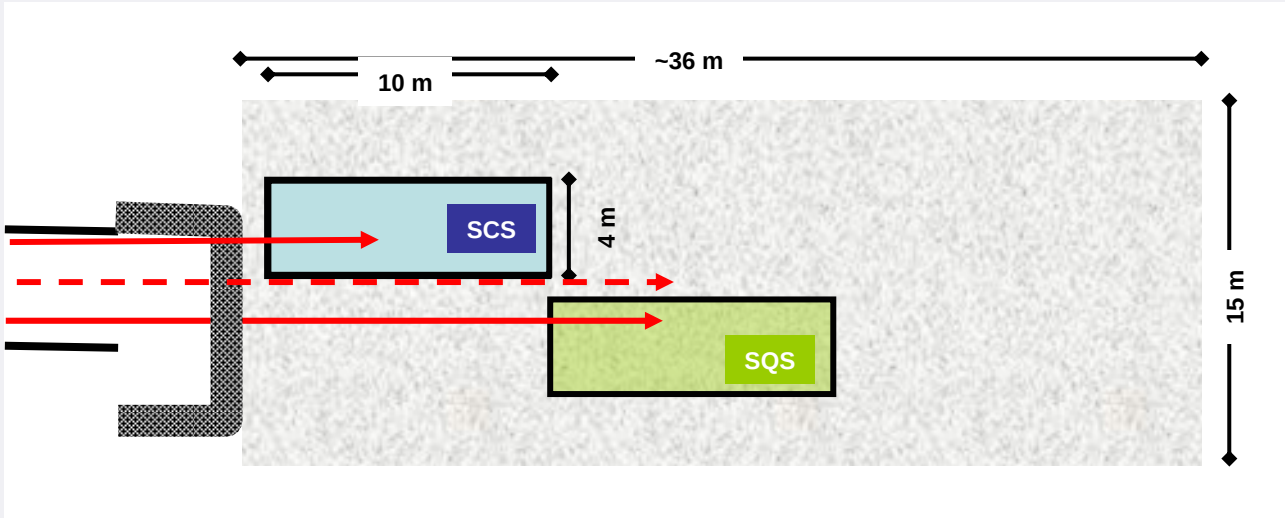
Experiments asking for highest intensity will not use monochromator branch

- FEL generation & x-ray beam delivery
  ⇒**photon energy, bandwidth, spot size, energy vs. power, …**
- SQS instrument implementation
  ⇒**techniques, instrumentation, detectors, lasers, …**
- needs for additional instrumentation
  ⇒**ion beam facility, …**

Experiments hall

X-ray/optical/control hutches

- two instruments: SQS & SCS
- optical laser
- beam separation 3–4 m



User community

Establish a community for the SQS instrument

- workshops, review, …
- provide some infrastructure for this, e.g. website, workshops, …

Follow-up processes

- interested groups should work out some of the technical aspects

  ⇒**requirements to area detectors for photons & particles**

  ⇒**optical laser needs**

  ⇒**realisation of specific parts of instrumentation**

Points of contact

- Search for leading scientist for SQS instrument has started
- Serguei Molodtsov on the management side

Report of the meeting

Time schedule SASE 3 beamline & instruments

Oct, '08 **User workshop in Aarhus**
- Review scientific scope and layout instruments
- Infrastructure needs for instruments

Jan, '09 **Rough concept for the SQS instrument**
- instrumentation and priorities
- allows to define requirements for x-ray optics & beam transport
- this will be followed-up by refining issues

End, '09 **Conceptual design of SASE 3 beam transport**

End, '10 **Technical design of SASE 3 beam transport**

Conceptual design of SQS instrument

End, '11 **Technical design of SQS instrument**

End, '13 **SASE 3 beam transport & SQS instrument ready for installation**

2014 **Initial beam & measurements**

2015 **Start full operation**

Conclusion

- **Startup scope of European XFEL includes one instrument for SQS science. The definition of this instrument, its main requirements and building blocks is reviewed by user community.**
- **In case parts of this instrument are exceeding the available funds a priority list needs to be established and other means of funding shall be investigated.**
- **Similar applies to further instrumentation incompatible with the realisation of instrument #1.**
- **Any request for instrumentation beyond the current project scope requires a strong statement of support by the user community.**

The European XFEL team is looking forward to working with you over the next years on defining and constructing this instrument.
→ Serguei Molodtsov

Acknowledgement

The European X-Ray Laser Project XFEL

International Workshop on the Science with and the Instrumentation for Small Quantum Systems at the European XFEL

October 29-31 2008, Department of Physics and Astronomy, University of Aarhus, Denmark

The study of Small Quantum Systems (SQS) of atomic, molecular, cluster, or crystalline character in gas phase experiments was one of the prioritized areas of science for the upcoming European XFEL facility as described in the Technical Design Report (available under www.xfel.eu) and includes studies of extremely dilute systems, of particles in traps, of non-linear processes using one- and two-color techniques and of ultrafast processes.

The workshop will bring together scientists interested in experiments using the SQS instrument at European XFEL facility both to review the science planned with this instrument, to discuss the requirements to the X-ray FEL beam delivery, and to initiate activities and collaborations on instrumentation and facilities needed at its photon endstations.

The workshop will include a series of invited lectures giving an overview of scientific and instrumental ideas for the SQS instrument followed by smaller working groups on specific instrumentation for the European XFEL facility.

Deadline Sep 1, 2008
YOUNG SCIENTISTS BURSARIES
for details see website

The workshop is co-funded by the European Commission through the Pre-XFEL project. This will allow free of charge access to the workshop, in particular cases support of travel cost might be possibleif requested by the speakers well in advance of the meeting. Hosting the workshop and support by the Department of Physics and Astronomy at the University of Aarhus is gratefully acknowledged.

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All participants who made this workshop a real success !