

SQS Status Report

Bldg. 28c, FLASH SR |

(Afternoon session 2)

SQS scientific instrument session

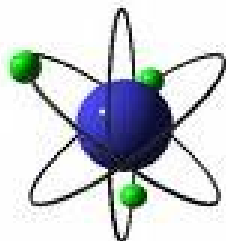
Session Chair: Michael Meyer

14:00 — 14:25	KB focusing optics	T. Mazza	XFEL
14:25 — 14:50	AQS & day-one instrumentation	A. DeFanis	XFEL
14:50 — 15:15	1D-imaging XUV spectrometer	J.E. Rubensson	U Uppsala
15:15 — 15:40	FEL diagnostics & SQS control system	T. Baumann	XFEL
15:40 — 16:10	Coffee break		
16:10 — 16:35	NQS & day-one instrumentation	Y. Ovcharenko	XFEL
16:35 — 17:00	REMI	M. Schöffler	U Frankfurt
17:00 — 17:25	Instrument Laser & timing diagnostics	P. Grychtol	XFEL
17:25 — 18:00	Schedule, early user workshop, Discussion/Closeout	M. Meyer	XFEL

SASE3 Performances

SASE3	$h\nu = 250 - 3000 \text{ eV}$	$P = 0.2 - 11.0 \text{ mJ}$	Lin./Circ. Pol.
	$\Delta T = 2 - 100 \text{ fs}$	Coherence: 0.96	Split & Delay

Atoms



Non-linear phenomena

$10^{17} - 10^{18} \text{ W / cm}^2$

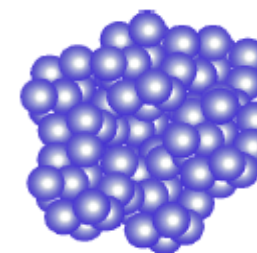
Molecules



Time-resolved studies

low jitter (<10 fs)

Clusters



Imaging experiments

Spatial coherence

European XFEL

High repetition rate:

< 27000 pulses/ sec



High data collection rate

Multi-particle coincidences

General Layout of SQS Scientific Instrument

AQS: Atomic-like Quantum Systems

Targets: atoms & molecules

Detection: electrons, ions, photons

- eTOFs High energy resolution
Non-dipole studies
- VMI Angular distribution
e / ion - coincidences
- MBES e / e – coincidences
- 1D Imaging XUV spectrometer

AQS

NQS

Timing
Diagnostics

Beam
Dump

REMI: Reaction Microscope

Targets: molecules

Detection: electrons, ions

Angle- and energy-resolved
electron and ion spectra
in coincidence

NQS: Nano-size Quantum Systems

Targets: Cluster, Nano-particles, bio-molecules

Detection: electrons, ions, photons

- DSSC 2D imaging Diffraction patterns
- ionTOF Mass spectra
- VMI Angular distribution
- eTOF High energy resolution

KB Optics

Bendable mirrors
3 interaction points
≤ 1 micron focus
variable focus size

Beam Position
Monitor

Gas Monitor
Detector

Alignment
Laser



AQS Chamber

■ eTOF

eTOF1 tested

eTOF2 & 3 production started

■ VMI

prototype tested

■ MBES

(in-kind: R. Feifel, U. Göteborg); delivery end of 2017

■ XUV spectrometer

(in-kind: J.-E. Rubensson, Uppsala); delivery end of 2017

■ Molecular beam

ready

■ COMO

(user consortium: J. Küpper, XFEL) delivery end of 2017

NQS Chamber

■ VMI ready end of 2017

■ iTOF ready end of 2017

■ DSSC delivery in 2018

■ MCP stack ready end of 2017

■ User contributions

■ Rare gas cluster sources

T. Möller, TU Berlin

■ Metal cluster source

P. Piseri, U. Milano

■ Scienta analyser

K.-H. Meiwes Broer, U. Rostock

■ Thomson Parabola

E. Rühl, FU Berlin

■ Fluorescence spectrometer

A. Ehresmann, U. Kassel

REMI (R. Dörner, Uni. Frankfurt)

■ Chamber tested

■ REMI delivery

Autumn 2017

KB focussing optics

■ Vacuum chamber installation

> September 2017

■ KB mirror delivery

December 2017

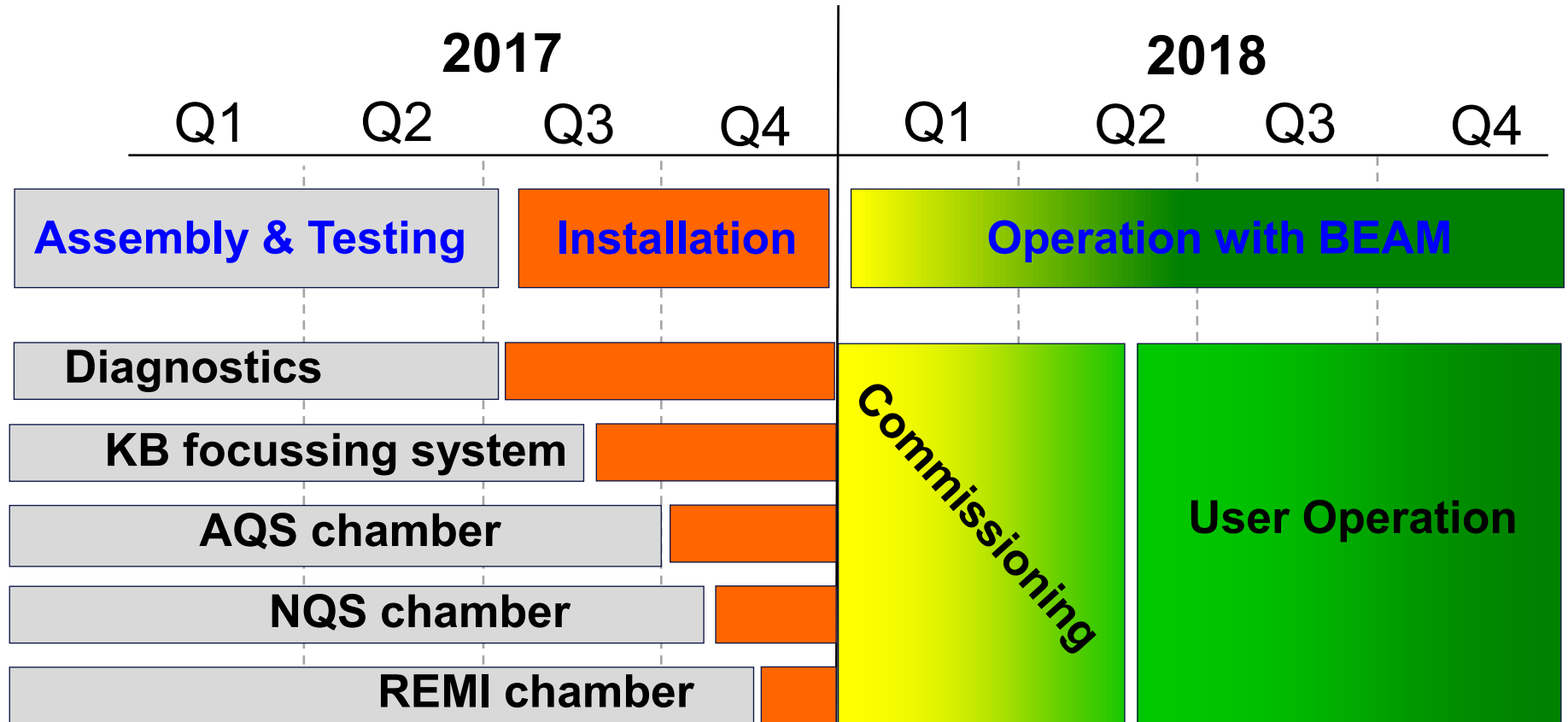
■ First SQS commissioning (plan B)

> January 2018

■ KB mirror installation

> July 2018

SQS Installation schedule



Hutch ready (July '17) 

Infrastructure ready (Sep '17) 

Hutch operational (Nov '17) 






First beam possible (> Jan '18)

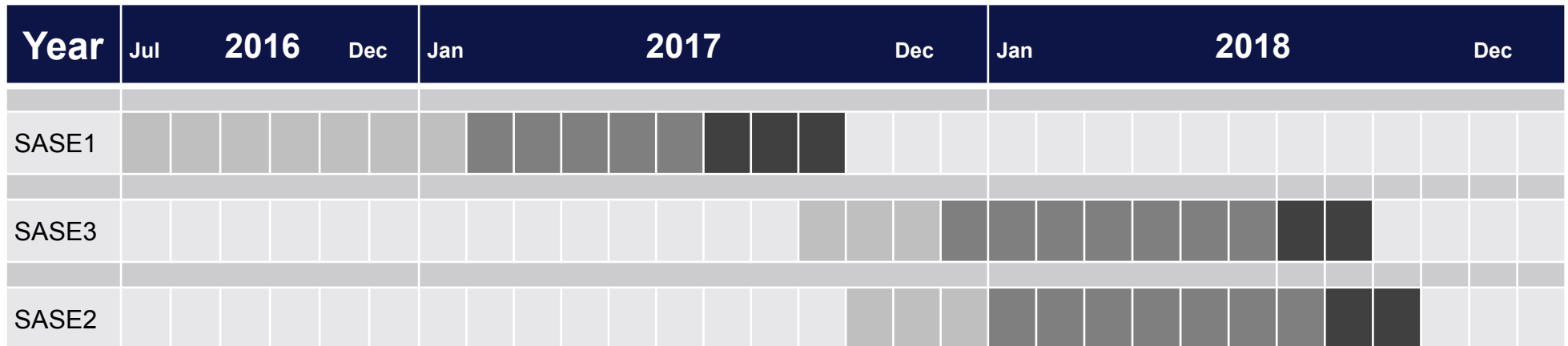
PP-laser installation schedule

M. Lederer, WP78

■ **General PP-laser installation schedule:**

-  **Task 1:** Laser tables and infrastructure in PP and ILH-hutches
-  **Task 2:** Components + commissioning in PP and ILH-hutches
-  **Task 3:** Beam to experiment for day-1

■ **SASE-specific schedules:**



SQS meetings and workshops

- **SQS: 1D Imaging XUV spectrometer** May 5th, 2017
- **SQS: AQS meeting** summer 2017
- **SQS: Pump-Probe meeting** Autumn 2017

■ **SQS and SCS User Operation Workshop:**

September 2017

Visit of European XFEL facility in Schenefeld

Wednesday, January 25th, 2017 , 15h30

SQS commissioning

- **Commissioning starts in beginning 2018**
 - **High intensities (tight focus)**
 - **Time-resolved studies (optical laser)**
 - **Diffraction (scattering detector)**

- **Commissioning of components largely driven by user proposals**

- **Day-one operation with reduced parameters for FEL**
 - **Not full bunch charge**
 - **Not full repetition rate**
 - **Not full photon energy range**

SQS Summary

- What topics did we miss?
- What topic should get special consideration?
- Feedback highly welcome
- Your FIRST experiment

Questions ? Comments?