

20th ESLS-RF Workshop

PAUL SCHERRER INSTITUT
PSI



Report of Contributions

Contribution ID: 0

Type: **Oral presentation**

RF operation at the SLS and status of the SLS2 proposal

Thursday, 17 November 2016 09:15 (20 minutes)

In spring several hours of accumulated down time occurred because of klystron reflected power interlock. A dozen of power glitches caused the LINAC- and storage-ring RF systems to trip. In the LINAC pulse forming network cabinet, a high voltage cable was burnt due to arcing and triggered the fire extinguishing system. Major maintenance tasks of this year include and refurbishment of power supplies of the klystron supply units. In summer 2016, the spare cavity was powered by the solid state amplifier and conditioned in the teststand. First tests to operate the booster cavity with the solid state amplifier were successful. The current status of the SLS upgrade proposal is presented with estimates of collective effects.

Primary author: Dr STINGELIN, Lukas (Paul Scherrer Institute)**Co-author:** CRAIEVICH, Paolo**Presenter:** Dr STINGELIN, Lukas (Paul Scherrer Institute)**Session Classification:** Session 5: Contributions from MAX-IV and SLS

Contribution ID: 1

Type: **Oral presentation**

The ELI-NP Gamma Beam System: A New Facility for Nuclear Physics Research –Current Status

Wednesday, 16 November 2016 16:20 (25 minutes)

The Gamma Beam System –the future user facility –is being built in the framework of the Extreme Light Infrastructure–Nuclear Physics (ELI-NP) project in Bucharest/Magurele, Romania. This is an advanced source of gamma rays based on Compton back-scattering. By collision of a visible laser beam and a high brightness relativistic electron beam, an intense ($\sim 10^{11}$ γ /s), brilliant γ beam ($<0.5\%$ bandwidth) with E_γ up to 19.5 MeV will be obtained.

A warm RF linac operated at the C-band mode with S-band photo-injector will deliver electron beams of energy up to about 720 MeV. The photo-injector laser system will produce a sequence of trains made of 32 laser pulses at 100Hz repetition rate with a ~ 10 ps pulse duration in the UV range. For the Interaction Points (IP) other lasers will produce pulses with energy of 0.2J, at 515nm and 3.5ps duration at a repetition rate of 100 Hz. The collision of the interaction laser pulses with the 32 electron micro-bunches every 10 ns will be ensured by an optical cavity –multi-pass re-circulator –that will recirculate 32 times each IP laser pulse. Appropriate collimators to filter out the energy spectrum and a γ -beam characterization system will be used.

The Gamma Beam System will be a state-of-the-art machine, capable to produce gamma beams with extremely advanced features. It will pursue advanced applications in the field of national security, nuclear waste treatment, nuclear medicine, as well as fundamental studies in nuclear physics.

Currently building construction as well as acceptance procedures of the linac system components corresponding to the gamma beam energy of minimum 1 MeV are completed (Project Stage I), and installation of accelerator is being started. The current status of the building and the RF linac for the Gamma Beam System will be presented.

Primary author: Dr TRACZ, Piotr (ELI-NP/IFIN-HH)

Presenter: Dr TRACZ, Piotr (ELI-NP/IFIN-HH)

Session Classification: Session 4: Contributions from ESRF, ELI and ESS

Contribution ID: 2

Type: **Oral presentation**

Status of Solaris

Wednesday, 16 November 2016 14:10 (25 minutes)

Solaris is a 3rd generation light source facility being built in Krakow, Poland at the Jagiellonian University Campus. The project is being accomplished in a tight collaboration with the MAX IV Laboratory in Lund, Sweden. After commissioning phase, last year was used mostly for storage ring beam optimisation nevertheless some works in the RF system have been done. The linac parameters have been fixed for stable, reproducible injection to storage ring. The 3rd order harmonic cavities with detuning plunger have been installed in storage ring and their commissioning have been started. Although the equipment is new some problems already appeared. This presentation will give a view on the recent status of RF in Solaris.

Primary author: Mr BOROWIEC, Pawel (National Synchrotron Radiation Centre Solaris, Jagiellonian University)

Presenter: Mr BOROWIEC, Pawel (National Synchrotron Radiation Centre Solaris, Jagiellonian University)

Session Classification: Session 3: Contributions from DLS, Solaris and ALBA

Contribution ID: 3

Type: **Oral presentation**

Ten years of operation with the SOLEIL RF systems (experience, upgrades, R&D's) and contributions to other projects

Wednesday, 16 November 2016 10:45 (25 minutes)

We report here about the ten-year operational experience with the SOLEIL 352 MHz RF systems, their main upgrades, related developments and contributions to other projects.

Summary

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Primary author: Dr MARCHAND, Patrick (Synchrotron SOLEIL)

Presenter: Dr MARCHAND, Patrick (Synchrotron SOLEIL)

Session Classification: Session 2: Contributions from SOLEIL

Contribution ID: 4

Type: **Oral presentation**

State of the art RF solid state power amplifiers

Wednesday, 16 November 2016 11:35 (25 minutes)

We report here about SOLEIL experience with the 352 MHz solid state power amplifiers (SSPA's) and its associated developments carried out in this domain. This technology, which has now reached maturity, is being adopted by many other facilities for applications ranging from 80 MHz up to 1.5 GHz. We make a (non-exhaustive) review of them.

Primary author: Mr DIOP, Massamba (Synchrotron SOLEIL)

Presenter: Mr DIOP, Massamba (Synchrotron SOLEIL)

Session Classification: Session 2: Contributions from SOLEIL

Contribution ID: 5

Type: **Oral presentation**

Status of RF at Diamond Light Source and overview of upgrade plans

Wednesday, 16 November 2016 13:45 (25 minutes)

Diamond Light Source has been operating for users since 2007 and presently operates with two CESR-B cavities supporting 300mA storage ring operation. RF reliability has been good in 2016 with RF MTBF approaching 200 hours for the year to date. Details are presented of the recovery from cavity failures in 2014 and 2015, particularly the repairs of the failed cryostat modules, including the first in-house cavity repair in an on-site cleanroom. Reliability and performance upgrades carried out in the last 12 months are presented and plans are given for the future introduction of two normal conducting cavities into the storage ring to support the operation of the two superconducting cavities.

Primary author: Dr CHRISTOU, Chris (Diamond Light Source)

Co-authors: Dr GU, Pengda (Diamond Light Source); Mr PANDE, Shivaji (Diamond Light Source)

Presenter: Dr CHRISTOU, Chris (Diamond Light Source)

Session Classification: Session 3: Contributions from DLS, Solaris and ALBA

Contribution ID: 6

Type: **Oral presentation**

Operational experience with the SOLEIL LINAC and status of the ThomX LINAC project

Wednesday, 16 November 2016 11:10 (25 minutes)

Operational experience with the SOLEIL LINAC
Status of the ThomX LINAC project

Primary author: Mr POLLINA, Jean-Pierre (Synchrotron SOLEIL)

Presenter: Mr POLLINA, Jean-Pierre (Synchrotron SOLEIL)

Session Classification: Session 2: Contributions from SOLEIL

Contribution ID: 7

Type: **Oral presentation**

Status and new developments of RF Systems of ALBA

Wednesday, 16 November 2016 14:35 (25 minutes)

ALBA is a 3Gev 3rd generation synchrotron light source located in Barcelona and operating with users since May 2012. The RF system of the SR is composed of 12 IOTs, providing up to 80kW each. The power of every pair of IOTs is combined in a cavity combiner (CaCO) and transferred to each cavity (6 in overall) through a waveguide system.

In this presentation we will cover RF operation statistics of last year, main operation problems and improvements of RF reliability. We will also show the last developments/upgrades of the ALBA RF Systems which includes:

- Amplifiers: New 500MHz SSA amplifier for Booster
- 3rd Harmonic System: Normal conducting, active third harmonic cavity with HOM dampers and SSA amplifier at 1.5GHz
- RF lab operation: Cyclotron Cavity Conditioning
- LLRF: Phase modulation for RF Trip compensation

Primary author: Ms SALOM, Angela (CELLS)

Presenter: Ms SALOM, Angela (CELLS)

Session Classification: Session 3: Contributions from DLS, Solaris and ALBA

Contribution ID: 8

Type: **Oral presentation**

Solid-state amplifier developments in PSI

Thursday, 17 November 2016 09:35 (20 minutes)

We describe the developments of our solid-state power amplifier technology in the Swiss Light Source (PSI). We will discuss about the installation, tests, control system, and test-stand system.

Primary author: Dr GASPAR, Marcos Andre (Paul Scherrer Institut)

Presenter: Dr GASPAR, Marcos Andre (Paul Scherrer Institut)

Session Classification: Session 5: Contributions from MAX-IV and SLS

Contribution ID: 9

Type: **Oral presentation**

Status of BESSY and bERLinPro

Wednesday, 16 November 2016 09:25 (25 minutes)

The status of RF at BESSY II will be reported. First year of operation of the solid state transmitters, problems with the 3rd harmonic (Landau) cavities and vacuum problems in the cavity section. The building of bERLinPro will be finished end of his year. There will be a brief report on the status of components and problems with the 270 kW 1.3 GHz klystron.

Primary author: Dr ANDERS, Wolfgang (Helmholtz-Zentrum Berlin)

Presenter: Dr ANDERS, Wolfgang (Helmholtz-Zentrum Berlin)

Session Classification: Session 1: Contributions from BESSY & bERLinPro and DELTA

Contribution ID: 10

Type: **Oral presentation**

An overview of the SwissFEL LLRF system and its potential use in the SLS

Thursday, 17 November 2016 11:35 (25 minutes)

The digital LLRF system for the SwissFEL was an internal development in the years 2012-2016 and is currently being installed and commissioned in the accelerator. It covers the different accelerating frequencies from S-band to C-band up to X-band and is built up in modular units. The tight SwissFEL requirements for stability demand a LLRF system which is capable to precisely measure amplitude and phase. The developed system fulfills these needs and would therefore also come into consideration for the SLS RF stations.

This presentation gives an introduction to the SwissFEL LLRF system architecture and summarizes its features and performance characterization results. A comparison with the requirements of the currently installed analog LLRF system at the SLS leads to an outlook for a rough upgrade proposal in the SLS.

Primary author: Mr KALT, Roger (Paul Scherrer Institut)

Presenter: Mr KALT, Roger (Paul Scherrer Institut)

Session Classification: Session 6: Contributions from ELETTRA and from SwissFEL LLRF

Contribution ID: **11**

Type: **Oral presentation**

Status of the SLS2 proposal

The current status of the SLS upgrade proposal is presented with estimates of collective effects.

Primary author: Dr XU, Haisheng (Paul Sherrer Institut)

Presenter: Dr XU, Haisheng (Paul Sherrer Institut)

Contribution ID: 12

Type: **Oral presentation**

Introduction of the Paul Scherrer Institute

An overview of the Paul Scherrer Institute will be presented with an emphasis on its accelerator facilities.

Primary author: Dr GARVEY, Terence (Paul Scherrer Institut)

Presenter: Dr GARVEY, Terence (Paul Scherrer Institut)

Contribution ID: 13

Type: **Oral presentation**

RF Upgrade Plans at DELTA

Wednesday, 16 November 2016 09:50 (25 minutes)

The 1.5 GeV storage ring Delta is currently equipped with a 40 kW klystron amplifier providing power to a single DORIS-type cavity.

With the advent of a new wiggler in 2018 also the RF system will be upgraded. An overview of the upgrade and its current status is given.

Presenter: Dr HARTMANN, Peter (DELTA, TU-Dortmund)

Session Classification: Session 1: Contributions from BESSY & bERLinPro and DELTA

Contribution ID: **14**

Type: **not specified**

SwissFEL Machine Tour

Thursday, 17 November 2016 13:45 (30 minutes)

Presenter: Dr PEDROZZI, Marco (Paul Scherrer Institut)

Session Classification: SwissFEL tour

Contribution ID: 15

Type: **not specified**

SwissFEL tour: Experiments

Thursday, 17 November 2016 14:15 (30 minutes)

Presenter: Dr PATTHEY, Luc (Paul Scherrer Institut)

Session Classification: SwissFEL tour

Contribution ID: **16**

Type: **not specified**

SLS Machine Tour

Thursday, 17 November 2016 15:25 (30 minutes)

Presenter: Dr STINGELIN, Lukas (Paul Scherrer Institut)

Session Classification: SLS Tour

Contribution ID: 17

Type: **not specified**

SLS Beam Lines

Thursday, 17 November 2016 15:55 (30 minutes)

Presenter: Mr MUELLER, Stefan (Paul Scherrer Institut)

Session Classification: SLS Tour

Contribution ID: **18**

Type: **not specified**

Status of RF operation and RF upgrade for the future Extremely Brilliant Source at the ESRF

Wednesday, 16 November 2016 15:30 (25 minutes)

Presenter: Dr JACOB, Jörn (ESRF)

Session Classification: Session 4: Contributions from ESRF, ELI and ESS

Contribution ID: **19**

Type: **not specified**

Coaxial tunnel roof feed through and its cooling

Wednesday, 16 November 2016 15:55 (25 minutes)

Presenter: Mr LANGLOIS, Michel (ESRF)

Session Classification: Session 4: Contributions from ESRF, ELI and ESS

Contribution ID: 20

Type: **Oral presentation**

Status of the Elettra RF plants

Thursday, 17 November 2016 10:45 (25 minutes)

Description of the 500 MHz reliability , failure statistics, servicing ...

Primary author: Dr INGRAVALLO, Vincenzo (Elettra - Sincrotrone Trieste)

Presenter: Dr INGRAVALLO, Vincenzo (Elettra - Sincrotrone Trieste)

Session Classification: Session 6: Contributions from ELETTRA and from SwissFEL LLRF

Contribution ID: 21

Type: **Oral presentation**

R/Q cavity measurement

Thursday, 17 November 2016 11:10 (25 minutes)

Perturbation's measurement performed on the Sesame and Indus II cavities: motivation and results.

Primary author: Dr PASOTTI, Cristina (Elettra - Sincrotrone Trieste)

Presenter: Dr PASOTTI, Cristina (Elettra - Sincrotrone Trieste)

Session Classification: Session 6: Contributions from ELETTRA and from SwissFEL LLRF

Contribution ID: 22

Type: **not specified**

ESS RF Systems

Wednesday, 16 November 2016 16:45 (25 minutes)

Primary author: Dr YOGI, Rutambhara (ESS)

Presenter: Dr YOGI, Rutambhara (ESS)

Session Classification: Session 4: Contributions from ESRF, ELI and ESS

Contribution ID: 23

Type: **Oral presentation**

Status of MAX IV Laboratory

Thursday, 17 November 2016 09:55 (20 minutes)

- MAX IV Overview
- Commissioning and operational status
- Ongoing and future project

Primary author: Mr MITROVIC, Aleksandar (MAX IV Laboratory)

Presenter: Mr MITROVIC, Aleksandar (MAX IV Laboratory)

Session Classification: Session 5: Contributions from MAX-IV and SLS