

Control & LLRF Activities at FLASH

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Outline

- Machine Studies at FLASH
 - *Schedule*
 - *Present Testplans*
- Opportunities for ILC EDR

Flash Schedule

- Commissioning 02.07.2007 - 12.08.2007 42 days
- FEL Studies 13.08.2007 - 02.09.2007 21 days
- **Accelerator Studies 03.09.2007 - 30.09.2007 28 days**
- FEL Studies 01.10.2007 - 18.11.2007 49 days
- **1. Beamtime** 19.11.2007 - 23.12.2007 35 days
- Maintenance 24.12.2007 - 06.01.2007 14 days

Flash Schedule 2008

- **Accelerator Studies** **07.01.2008 - 20.01.2008** **14 days**
- FEL Studies 21.01.2008 - 10.02.2008 21 days
- **2. Beamtime** 11.02.2008 - 09.03.2008 28 days
- FEL Studies 10.03.2008 - 30.03.2008 21 days
- **3. Beamtime** 31.03.2008 - 27.04.2008 28 days
- Maintenance 28.04.2008 - 18.05.2008 21 days
- FEL Studies 19.05.2008 - 08.06.2008 21 days
- **4. Beamtime** 09.06.2008 - 06.07.2008 28 days
- FEL Studies 07.07.2008 - 27.07.2008 21 days
- **5. Beamtime** 28.07.2008 - 24.08.2008 28 days
- **Accelerator Studies** **25.08.2008 - 14.09.2008** **21 days**
- FEL Studies 15.09.2008 - 05.10.2008 21 days
- **6. Beamtime** 06.10.2008 - 02.11.2008 28 days
- FEL Studies 03.11.2008 - 23.11.2008 21 days
- **7. Beamtime** 24.11.2008 - 21.12.2008 28 days
- Shutdown 22.12.2008 - 15.03.2009 84 days

LLRF Studies Sep. 2007 (1)

- [Test of Multichannel Downconverter for LLRF Matthias Hoffmann](#)
- [Beam based beam loading compensation at ACC1 Elmar Vogel](#)
- [Beam based ACC1 rf field stability measurement using BC2 beam diagnostics Elmar Vogel](#)
- [Multicavity Complex Controller \(MCC\) Tomasz Czarski](#)
- [Vector-Sum Calibration with Beam and Beam Diagnostics Valeri Ayvazyan](#)
- [For./ref. rf power cal, w/wout beam, probe calculation Waldemar Koprek](#)
- [Multi-bunch transient detection with different electronics Petr Morozov](#)
- [Grad./phase calibration with full beam loading Valeri Ayvazyan](#)
- [Operation at different gradients \(gradient spread\) Valeri Ayvazyan](#)
- [Operation close to limits \(klystron saturation., cavity/coupler limit\) Wojciech Cichalewski](#)
- [Beam Based RF Amplitude and Phase Calibrations Valeri Ayvazyan](#)

LLRF Studies Sep. 2007 (2)

- [Radiation effects on electronics Mariusz Grecki](#)
- [Physical System Parameters Identification Christian Schmidt](#)
- [Off-crest operation in ACC456 Valeri Ayvazyan](#)
- [Performance evaluation of ILC Americas No. 1 LLRF Controller Gustavo Cancelo](#)
- [Evaluate ILC America No. 1 Downconverter and Vectormodulator Brian Chase](#)
- [Performance evaluation of new FLASH MO and Distr. with beam Henning Weddig](#)
- [Evaluation of Operational Procedures for Automation Wojciech Cichalewski](#)
- [Test of Components needed for Automation Boguslaw Koseda](#)
- [Operation of universal controller Wojciech Jalmuzna](#)
- [Test of new features in LLRF controller at ACC1 Waldemar Koprek](#)

Example Test Plan

Title: Improvement of beam loading compensation using toroid monitor signals in ACC1

Contact persons: Waldemar Koprek, Holger Schlarb, Elmar Vogel, D. Nölle

Motivation / Goal: The fast proportional rf feedback corrects stabilizes the rf field degraded by the beam loading of a long bunch train within 20 us. Hence, the first 20 bunches of a long bunch train obtain different accelerating gradients and energy

Studies / Goal:

- 1. Implementation of a proportional rf control loop stabilizing the klystron output only.**
- 2. Verification of the klystron stabilization by measuring the beam energy stability without**

Ideas for additional Test Time

- **Alternating pulse operation**
 - *Alternating user and machine study pulses*
- **Parasitic development**
 - *Example LLRF in ACC1*
 - *But no HW changes during user run*

Ideas for Future Controls/LLRF Tests

- Automatic Failover (e.g. Laser)
- Evaluate new timing system
- Automation (e.g. Klystron)
- Alternating pulses (e.g. high gradient)
- Piezotuner operation
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