RF Deflectors
- Activities at FLASH -

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Outline

1. Overview of FLASH and the RFD Setup
   - Past FLASH Layout and RF Deflector Setup
   - Future FLASH Layout and RF Deflector Setup

2. Collaboration with the IRUVX WP3 “Long. Diag.” EG
   - Potential Collaboration in the Future
Past FLASH Layout and RF Deflector Setup

Present layout

**Figure:** FLASH Layout Before Shutdown in 2009. (K. Honkavaara)

**Figure:** RF Deflector Setup Before Shutdown in 2009. (M. Röhrs)
LOLA-type RF Deflector (RFD)

- Manufactured in 1968 and installed at FLASH in 2003 (DESY-SLAC).
- Normal conducting (copper) waveguide structure ($\frac{2\pi}{3}$-mode).
- Frequency of 2.856 GHz (S-Band).
- Total length of 3.6 m, and cell length of 35 mm.
Previous RFD Measurements at FLASH

**Figure:** Measurements by M. Röhrs et al..

### RFD measurements with high resolution
- Longitudinal beam profile (left image)
- Longitudinal phase space (middle image)
- Slice emittance (right image)

Transverse phase space determination by tomographic methods.
Future FLASH Layout

Figure: FLASH Layout After Shutdown in 2009. (K.Honkavaara)
New Beamlines with Dedicated RF Deflector Setup

Figure: New Beamlines with RFD Setup After Shutdown in 2009.

Features and Goals

- RF Deflector “LOLA” directly in front of the FEL-Undulators.
- Dispersive beamline for longitudinal phase space measurements.
- Optics design for parasitic RFD operation with high resolution.

The new RF Deflector setup is essential for the commissioning of the third-harmonic RF system.
Potential Collaboration in the Future

Schedule in 2010

- Mount new electron beamlines including the RFD setup:
  January
- Commissioning of OTR/Scintillator screen stations and optical setups:
  End of January - Middle of February
- Commissioning of the RFD setup and measurement procedures:
  Each possible time slot until May.
- Commissioning of the third-harmonic RF system:
  May – June/July

Everybody in the IRUVX WP3 “Longitudinal Diagnostics” EG is invited to support the RFD team at FLASH!

The End
Thank you for your attention!