# HZDE LLRF status report

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Plans for future
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# Outline

### ELBE

### 2 Status

### Recent developments 260 MHz Buncher Real-time BLC

### 4 Plans for future

Hardware Software / Firmware Installation

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ELBE		Plans for future
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### 1 ELBE

### 2 Status

8 Recent developments

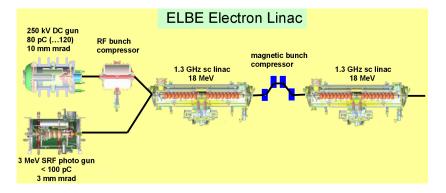
### Plans for future

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# Layout of ELBE



Source: Peter Michel "ELBE Upgrade ", ARD Workshop February 2013

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### **O** ELBE

### 2 Status

8 Recent developments

### Plans for future

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ELBE	Status		Plans for future
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# (Almost) Done

### System

Closed loop operation verified

### Hardware

- Power supply
- MCH / CPU
- SIS8300L2 (digitizer+controller)
- DRTM-DWC8VM1

### Firmware

- DRTM-DWC8VM1 BSP
- SIS8300L2 BSP (minor changes expected)
- Controller application (minor changes expected)

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### Ø Status

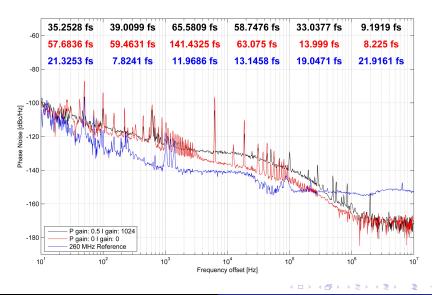
3 Recent developments 260 MHz Buncher Real-time BLC

Output Plans for future

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ELBE	Recent developments	Plans for future
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260 MHz Buncher		

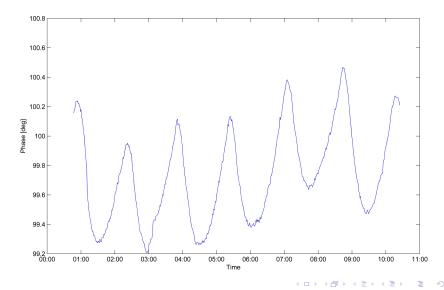
# Results: phase noise



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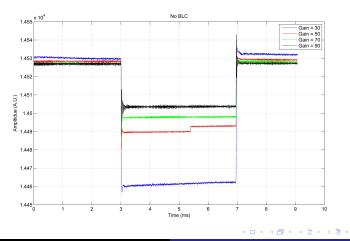
ELBE		Recent developments	Plans for future
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260 MHz Buncher			
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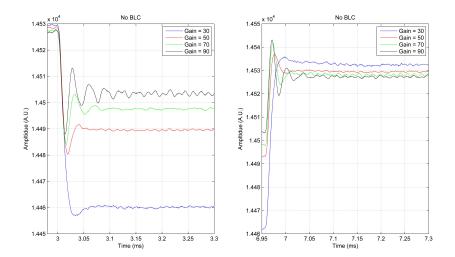
ELBE	Recent developments	Plans for future
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Real-time BLC		
Problem		

Control loop react (with a delay) to sudden drop in the gradient. Proportional controller supresses the error, but not perfectly. Integral controller can not have doubling time short enough.



ELBE	Recent developments	Plans for future
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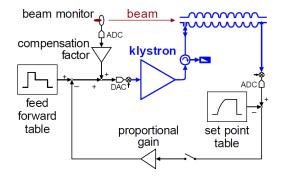
#### Real-time BLC



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ELBE	Recent developments ○○○○●○○	Plans for future
Real-time BLC		
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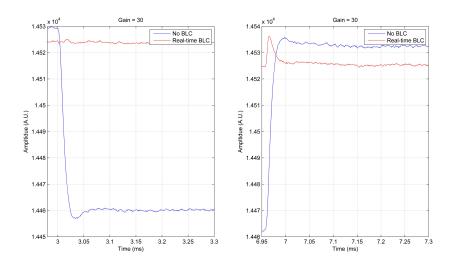
E. Vogel, et al. "Beam loading compensation using real time bunch charge information from toroid monitor at FLASH" (PAC 07)

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#### Real-time BLC

# Results: BLC (Gain = 30)

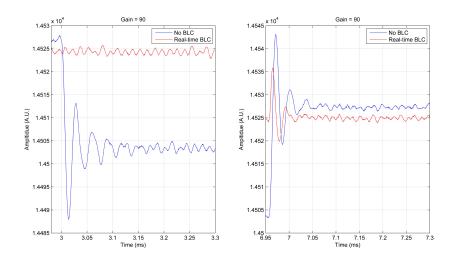


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Real-time BLC

# Results: BLC (Gain = 90)



ELBE		Plans for future
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### Ø Status

8 Recent developments

### **4** Plans for future

Hardware Software / Firmware Installation

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ELBE	Recent developments	Plans for future
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Hardware		

### Awaiting new revision

DRTM-DS8VM1

### Must be build

- LO Generation Module (UNILOGM)
- Reference distribution box

### Needs implementation

• Timing / Interlock module

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ELBE	Recent developments	Plans for future
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Software / Firmware		

### Firmware

- A BSP for the DRTM-DS8VM1 must be implemented.
- Access to the source code must granted by Holger Schlarb.

### Software

- API specification from Martin Killenberg.
- Adaptor to be developed for HZDR.

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ELBE	Recent developments	Plans for future
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Installation		

### Rack occupation

A drawing should be prepared.

### Cabling

To be done after the LO Generation and Reference distribution modules are build. Low drift cables prefered.

### Training

HZDR's stuff must be trained.

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# Questions



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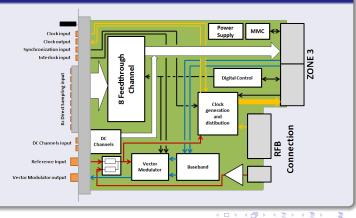
# Thank You for attention!

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### DRTM-DS8VM1

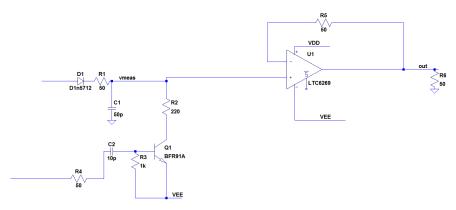
Designed for direct sampling of low frequency signals 2nd revision (major changes)

### Block diagram



ELBE	Recent developments	Plans for future
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# Analog front-end



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