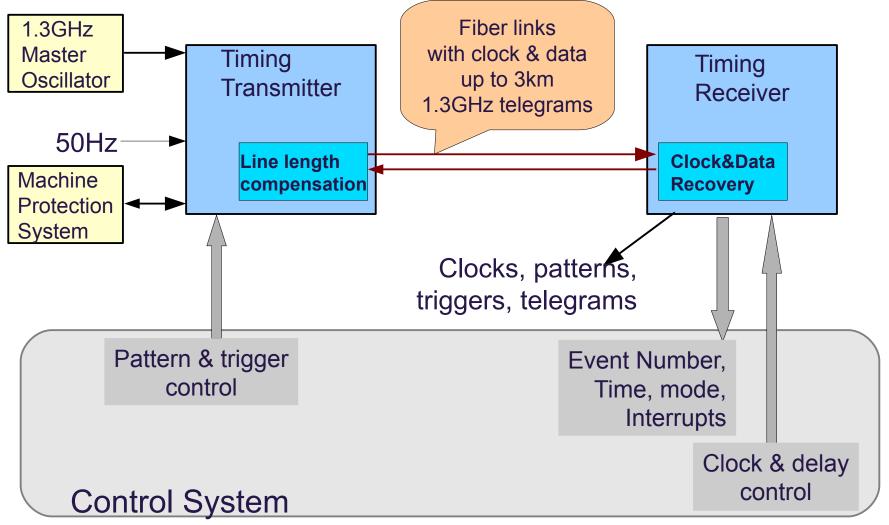


### **XFEL Timing System**

#### Status 10.2009

Christian Bohm Attila Hidvégi Patrick Geßler Kay Rehlich Status of the XFEL Timing

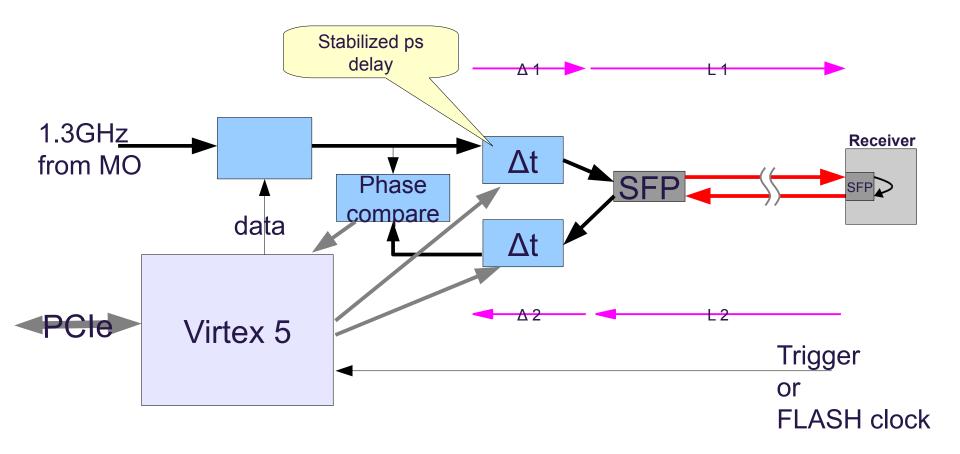
## **XFEL** Timing System Blocks





Status of the XFEL Timing

# XFEL Drift Compensation Schema

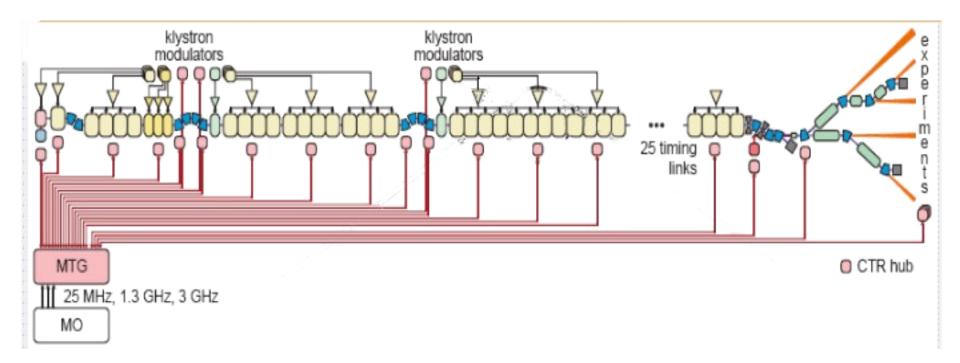








# XFEL Star Topology to Distribute Timing

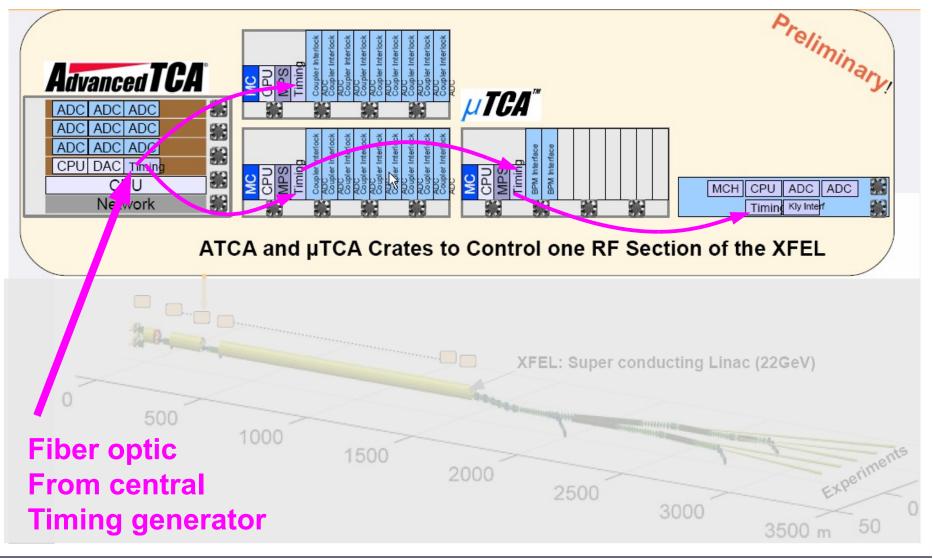






# 5

#### XFEL Local Timing Distribution



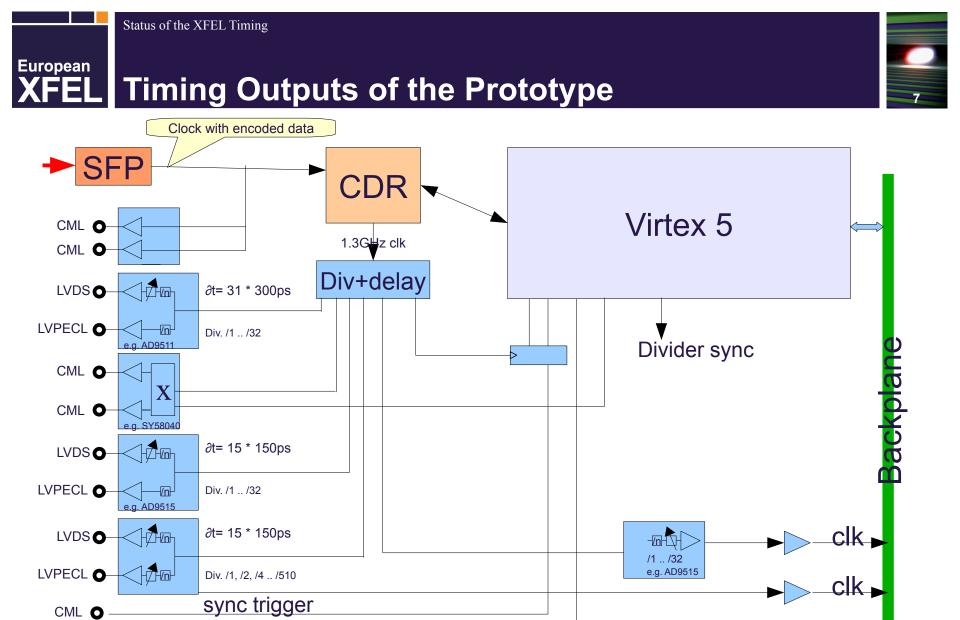
22.10. 2009 Kay Rehlich, WP 28

European





- 6 AMC boards are ready since a few days
- First results:
  - All functions work so far
  - Random jitter (RMS) of outputs: 1.5ps
  - Test with Xmitter Receiver link to be done



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LVDS

2 trigger



European Status of the XFEL Timing   KFEL Clock and Trigger Sequences		
100 ms		
100 kHz ?		
50 Hz		
Trig: 10 Hz		
Event: Laser start		
Event: RF start	able delays	
Event: firs <u>t bunch</u>		
Event: las <u>t bunch</u>		
Bunch clo <u>ck</u>	Max 5.0 or 4.5 MHz	
Cavity and bunches	L L L L L L L L L L L L L L L L L L L	



## XFEL Preliminary Specs

- Trigger:
  - Timing resolution: 1.54ns
  - Programmable with 32 bits (max delay seconds)
- Clocks:
  - Jitter: < 5ps RMS (goal)</li>
  - Constant or burst (e.g.bunch clock)
  - Automatic adaption of location/beam mode
  - Fixed e.g. 100kHz (with const. Delay to first bunch)
  - Raw 1.3GHz telegrams with encoded data
    - Data format is not yet fixed (e.g. number of filler words for the clock recovery TBD)



