

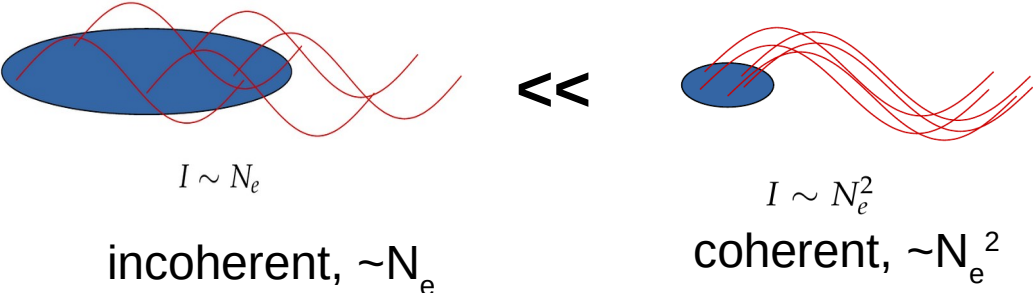
# Coherent Radiation Diagnostics at EuxFEL and FLASH

N. M. Lockmann on behalf of MSK group

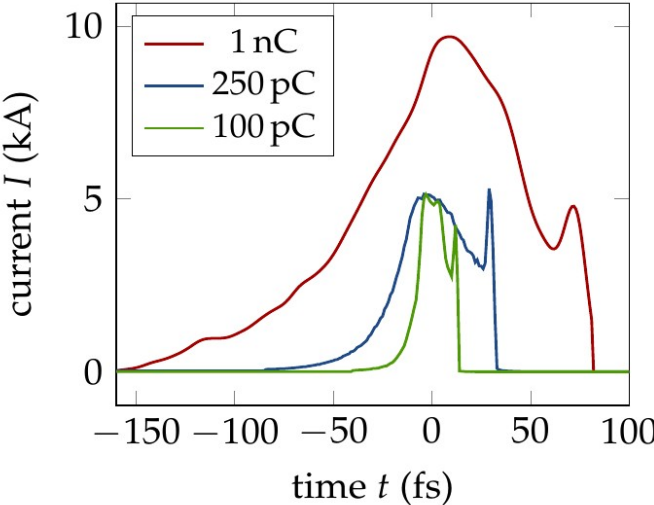
11<sup>th</sup> Workshop on Longitudinal Electron Bunch Diagnostics  
Lille, 29.6-1.7.2022

# Coherent Radiation Diagnostics

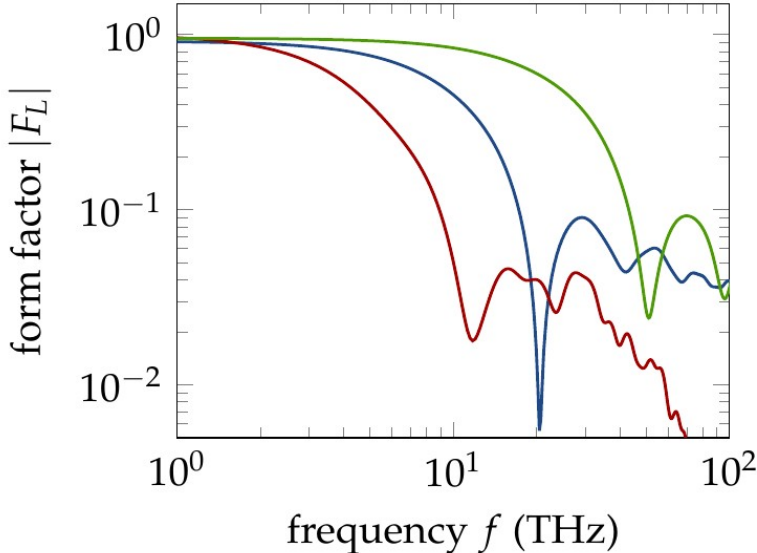
## Coherent Emission of Radiation



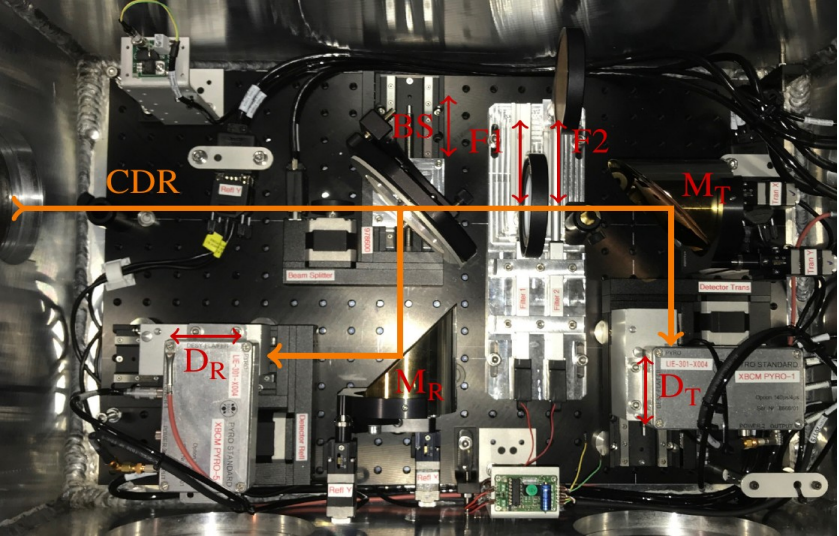
## Longitudinal Form Factor



$$F_l(\omega) = \int_{-\infty}^{\infty} \rho(t) e^{-i\omega t} dt$$

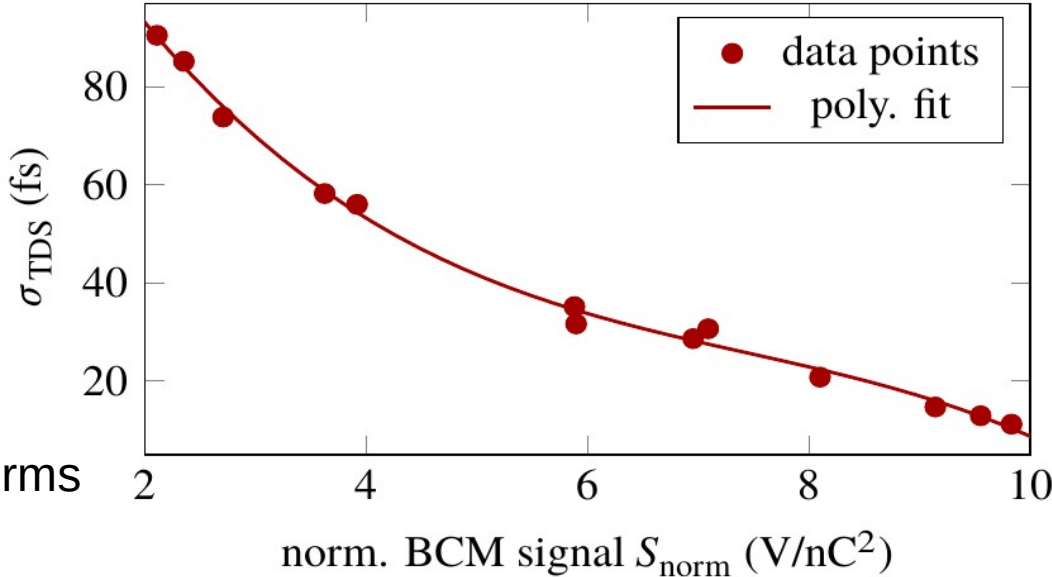
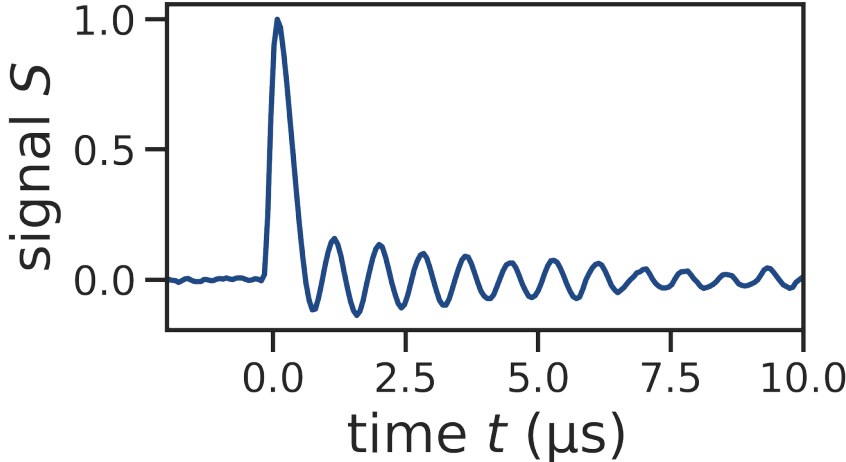


# Bunch Compression Monitors



- Radiation source
- Setup
  - Detectors
  - Optics

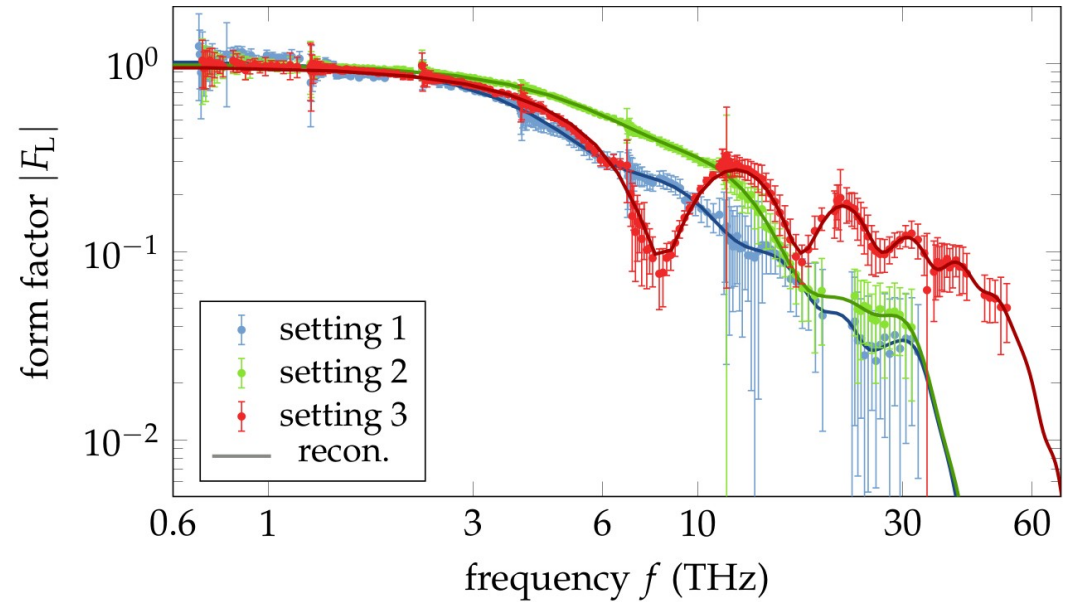
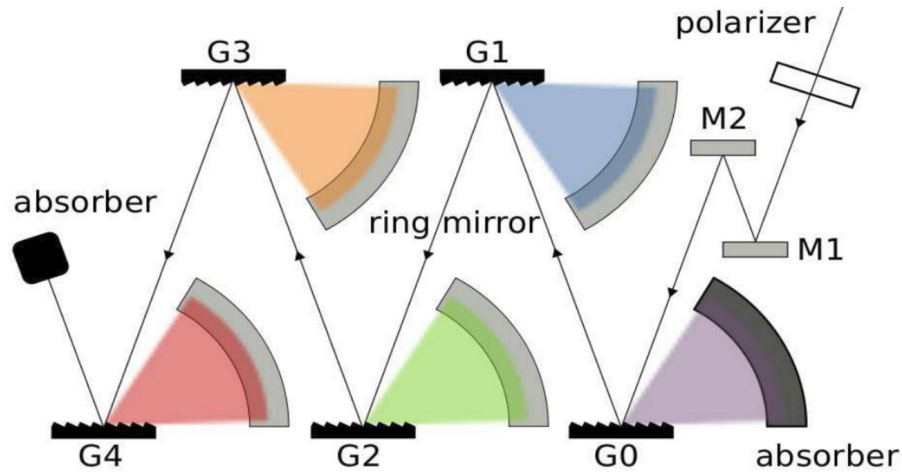
- Pyro-electric detectors -> Pileup
- Correction on FPGA for fast intra-bunch feedbacks (MHz)



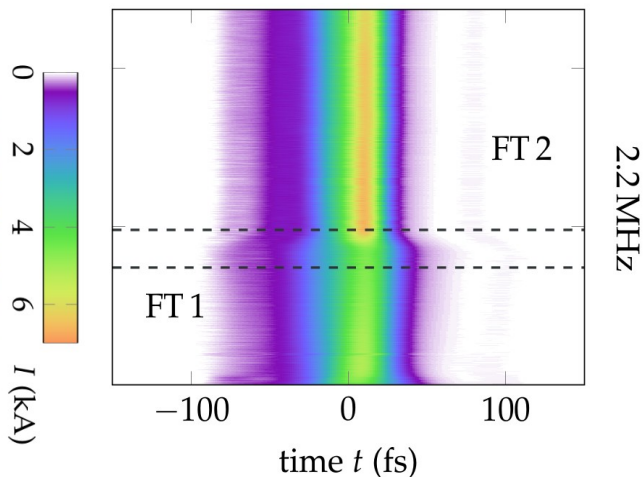
- Calibration to get rms bunch duration

# CRISP Spectrometer

- Single-shot broadband THz spectrometer



- Noninvasive + MHz current profile measurements



- Calibration of spectrometer sensitivity

- Application as Virtual/Mixed Diagnostics

