



10th Workshop on Longitudinal Electron Bunch Diagnostics

13-15 November 2019

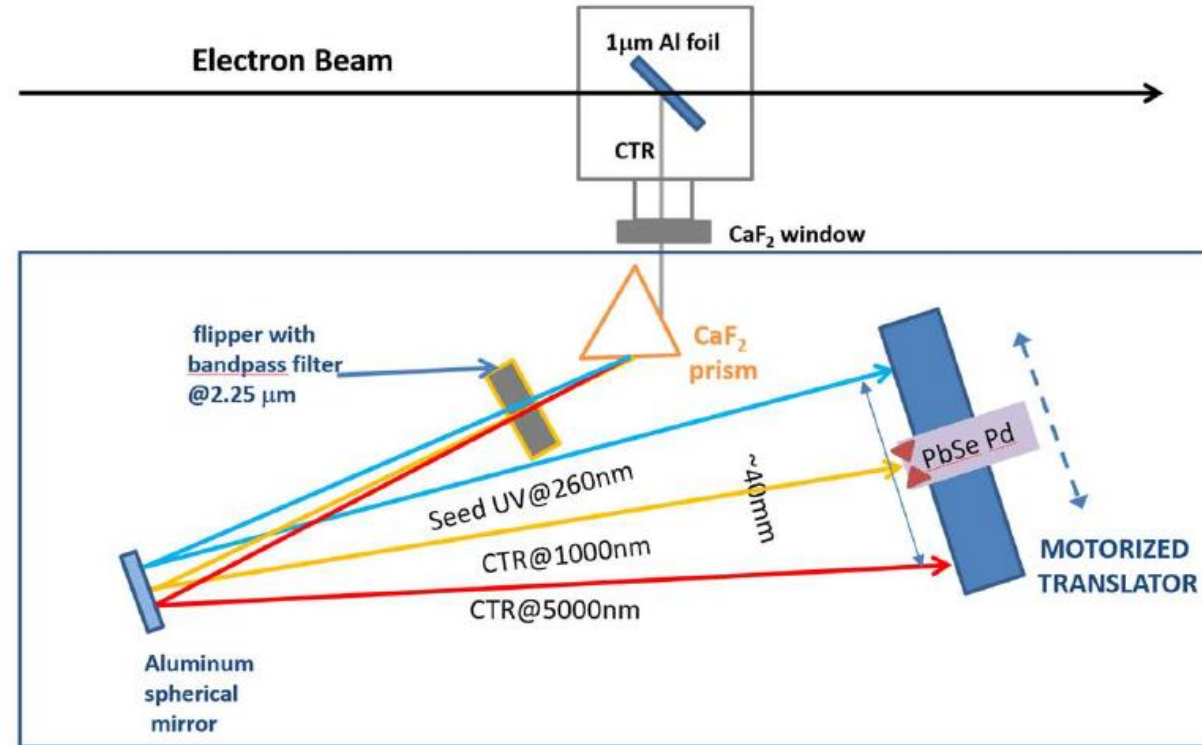
PSI

Europe/Zurich timezone

Summary WG1 THz detector and Compression Monitors

- **FERMI:**

Scanning spectrometer:
(based on discussion on last
workshop at DELTA)



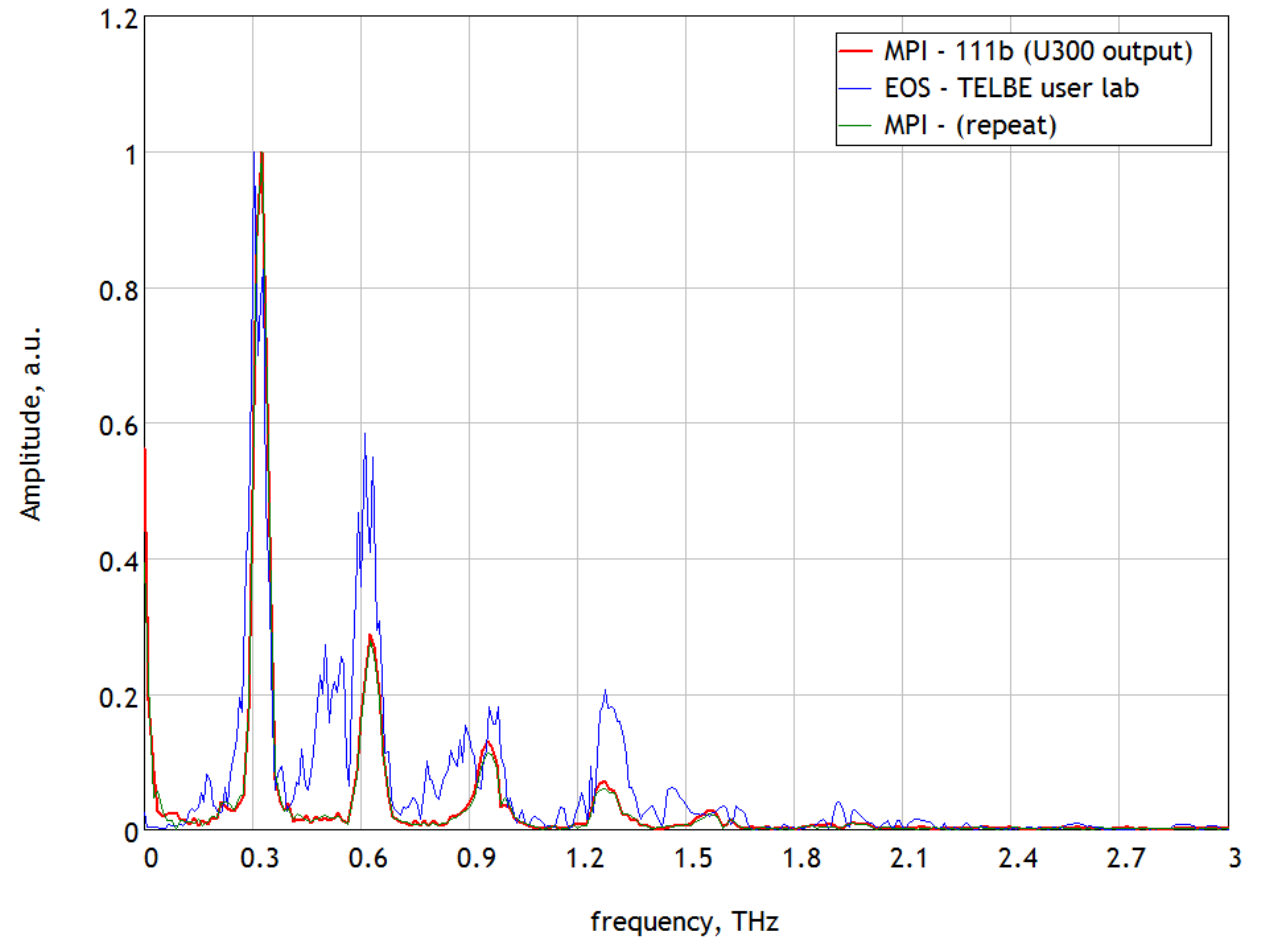
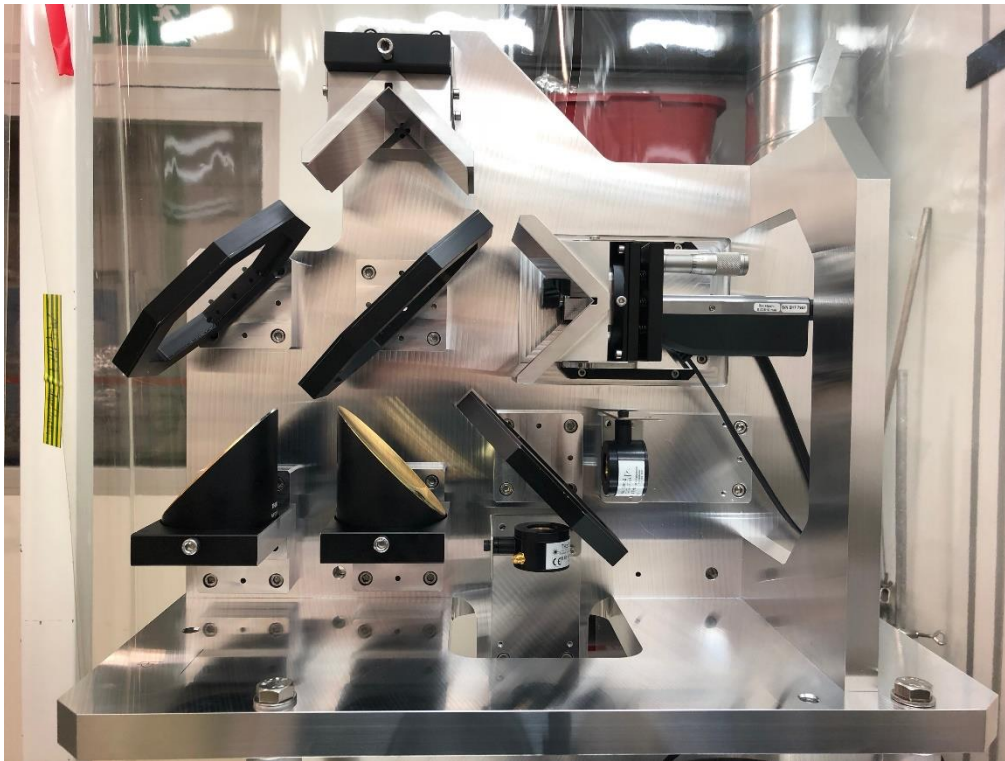
- installation Q1/2020 commissioning for LH diagnostics, microbunching

- **HZDR:**

MPI: < 5THz (limiting factor: free standing wiregrids), commercial Pyro-electric detector.

- 3 MPI devices installed. One routinely used for THz undulator spectral measurements.

- commercial components for 1 MPI in house, planned to be assembled in house. To be used as an R&D

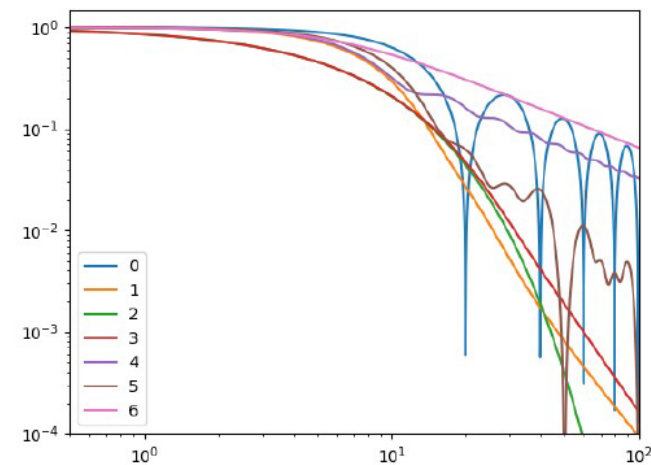
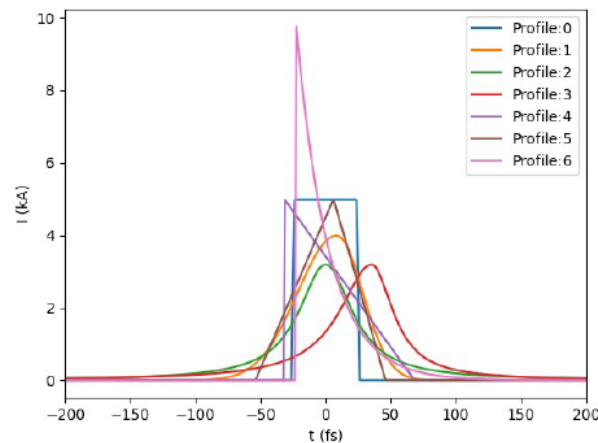


- **EU-XFEL:**

How to extract figure of merit for measured spectrum? (shared by PSI)

Feedback?!?!?!?

- Is there any gain for Feedback from the spectrometer compared to BCMs?
- Experiences?
- Study
 - Model functions (Gauss, Supergauss, Triangle, Exponentiell Step, etc...)
 - Change width of profiles and see how BCM (Integral of FF) and other ways compare to width and peak current

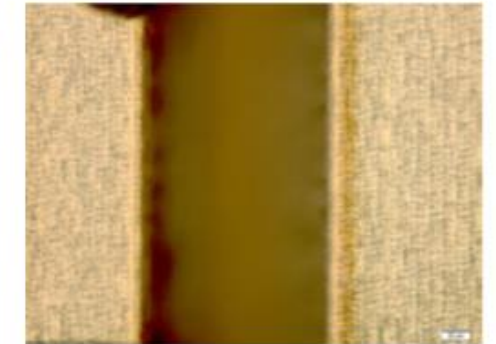
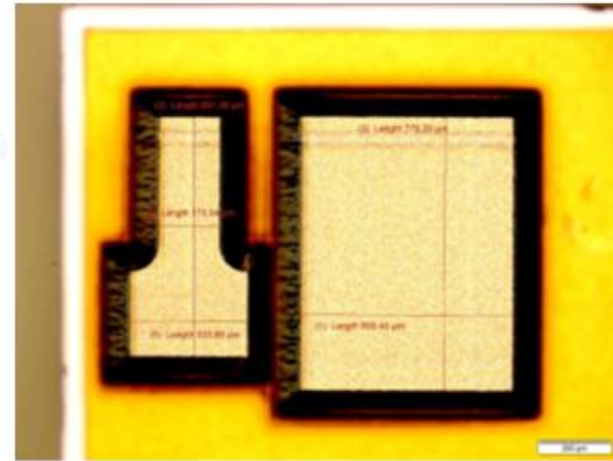
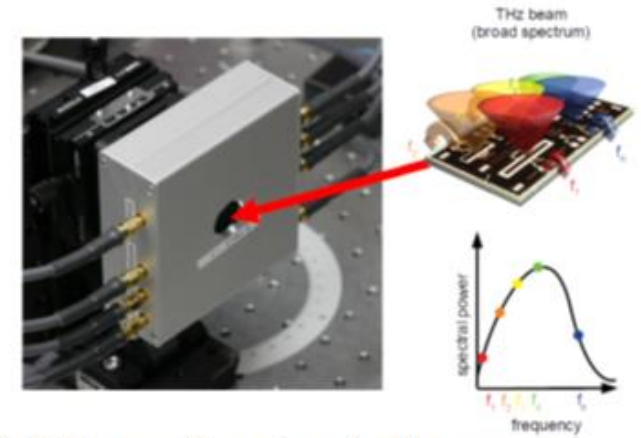


No immediate solution/proposal

Other approach: Use machine learning to setup machine on given formfactor-spectrum

On-chip spectrometer production status

- Chip manufacturing → successfully finished
- Chip thinning including assembly on interposer → delayed
 - Delay in placing of order at FHI
 - Delay at TUD preparation of production data (funded project ended 06/19, high workload and other assignments)
 - Delay at FHI manufacturing
 - Good news: no technical issues, first thinning tests have been successful, selective laser thinning is better than previous mechanical thinning (accuracy, yield)
 - Thinned chips expected 01/2020
- Planned assembly and test at TUD: 01-02/2020
- Planned availability to facilities: 03/2020
- **Characterization at DELTA**
(Measure at three frequencies + broadband - linearity with respect to incident power)



Microscope images of selectively laser-thinned chips

Rename working groupe for further workshop:

FDI :: Frequency domain instrumentation

- includes:
- Bunch compression monitors
 - Microbunching diagnostics
 - diagnostics for photon induced beam manipulation
HERO/Seeding/LH/...

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