Recent Updates of the Longitudinal Diagnostics for Beam-Based Feedbacks at FLASH

11th MT ARD ST3 Meeting 2023 in Dresden-Rossendorf

Marie Kristin Czwalinna

Dresden, July 5^{h} – 7th 2023

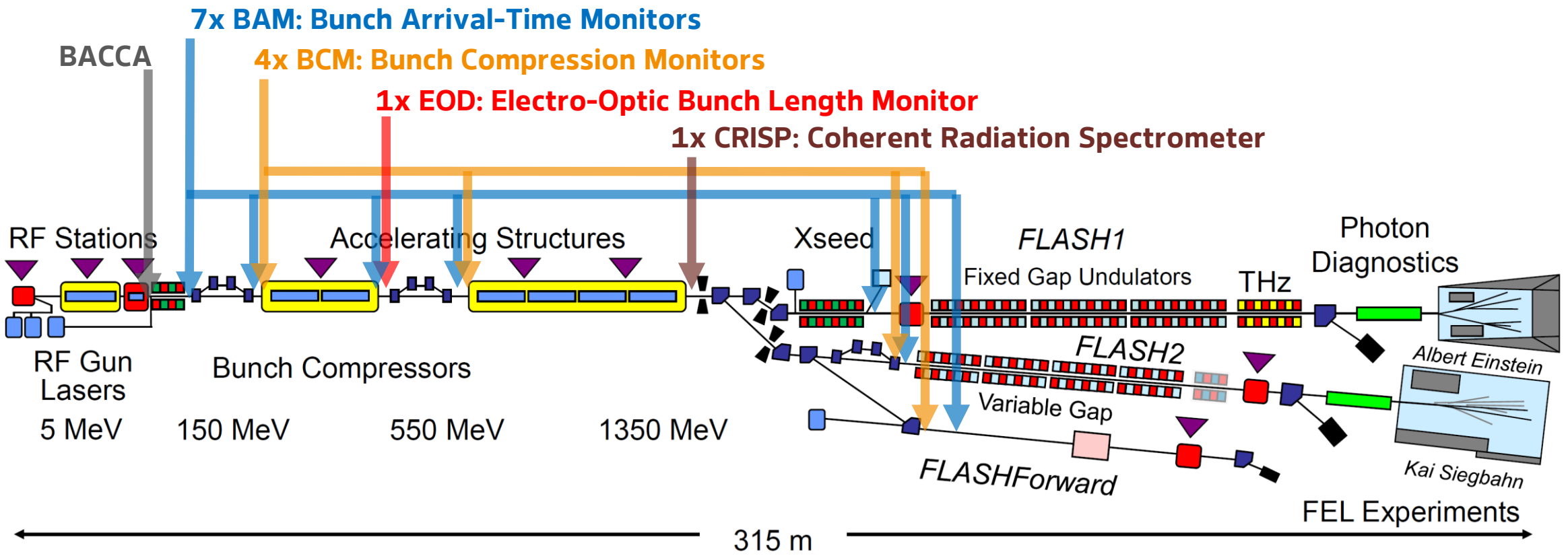
HELMHOLTZ

DESY.

FLASH – status 2022/23

Longitudinal Diagnostics : New & Refurbished

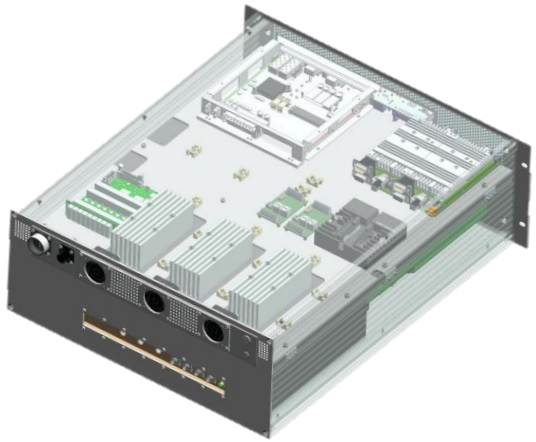
FLASH.
Free-Electron Laser FLASH



Diagnostics Design & Functionality

Achievements & On-Going Developments

FLASH.
Free-Electron Laser FLASH



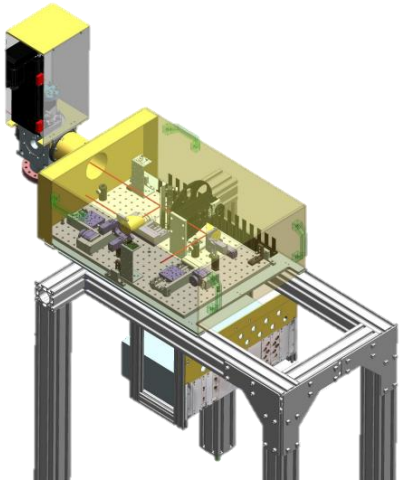
Bunch Arrival-Time Monitors…. With femtosecond resolution at 50…400pC

Arrival-time Measurement Reliability
→ **Poster by Jiri Kral** (DESY)

New 100GHz RF design… for femtosecond resolution at 1pC
→ **Poster by Bernhard Scheible** (THM)
→ **Poster by Nisamol T.A.N.** (DESY)

Beam-Based Feedbacks
Distributed feedbacks,
low-latency data connections,
single-digit femtosecond arrival-time stability

Bunch Compression Monitors



Coherent Diffraction Radiation
THz spectrometer

& **CDR beamline with "open" ports**

0.1…10 THz
with ca. 300nJ/100GHz BW

Single-shot
Electro-optical Bunch Length Monitor
Development & PhD project
together with Université de Lille

→ new configurations to improve resolution & SNR

FLASH.
Free-Electron Laser FLASH

Contact

Deutsches Elektronen-
Synchrotron DESY

www.desy.de

Marie Kristin Czwalinna
MSK
marie.kristin.czwalinna@desy.de
+49 40 8998 9-2912