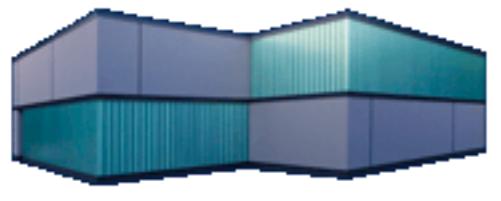




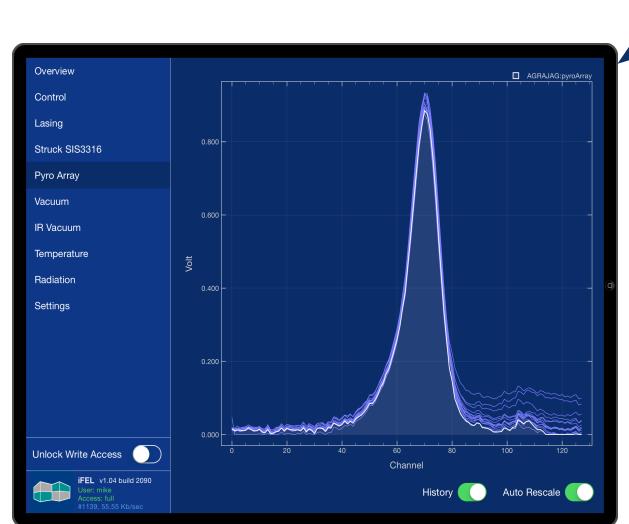
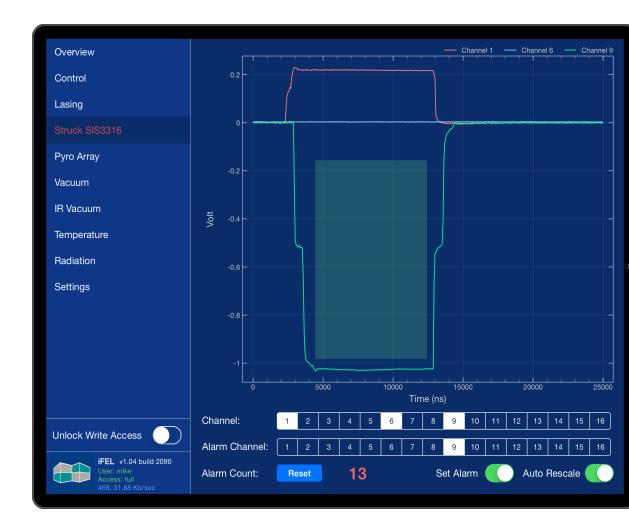
Laser Beam Profiling and Further Improvements to the FHI FEL (MOPGF026)

Heinz Junkes, Wieland Schöllkopf, Mike Wesemann (Fritz-Haber-Institut, Berlin)



FHI FEL

- Mid infrared FEL (radiation from $3.5 \mu\text{m}$ to $50 \mu\text{m}$)
- For investigations of molecules, clusters, nanoparticles, and surfaces
- More than 200 pC band charge and up to 50 MeV
- Gridded thermionic electron source
- Single plane focusing undulator
- Cavity 5.4 m long
- First lasing Februar, 2012

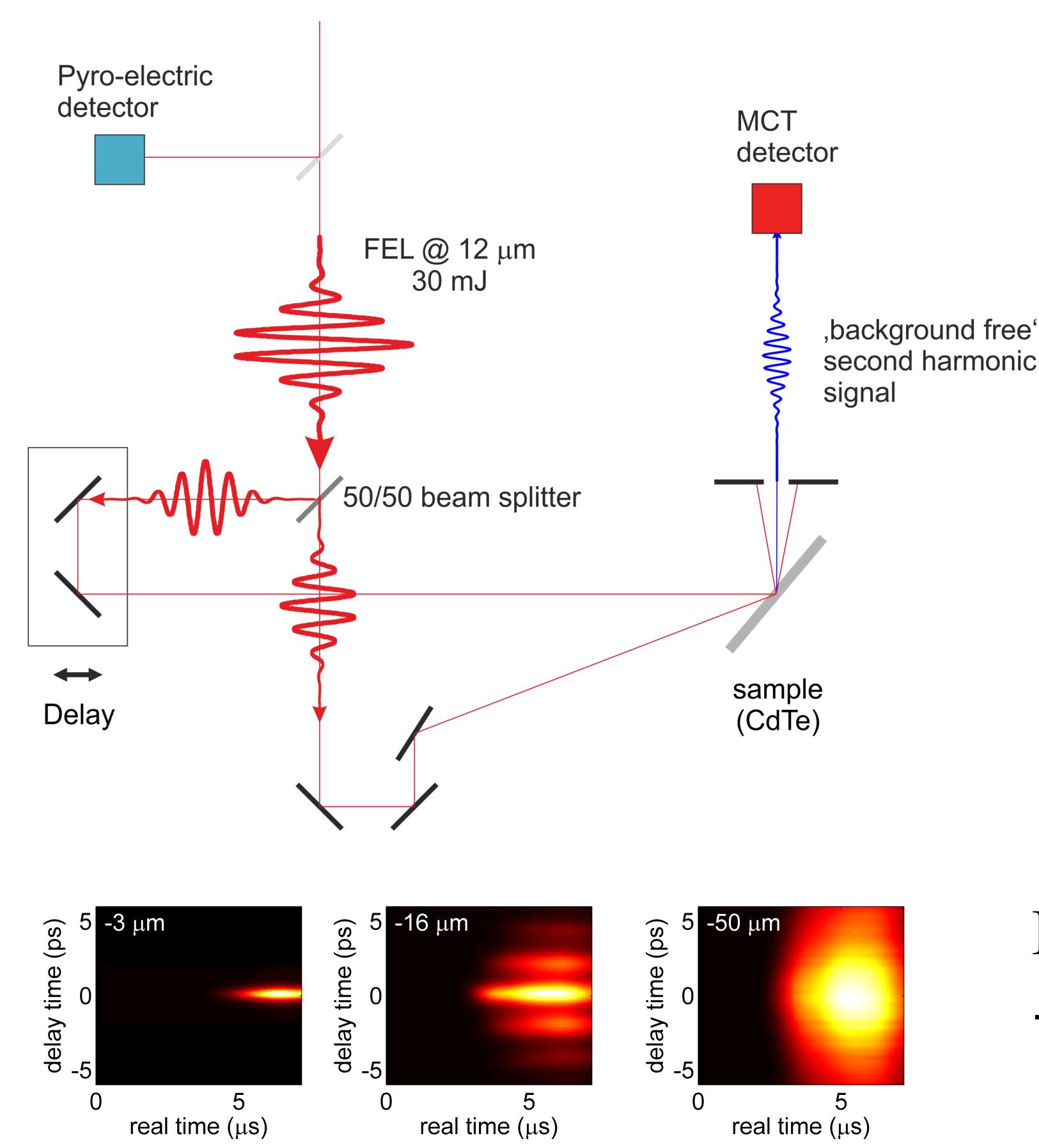


iPad - App

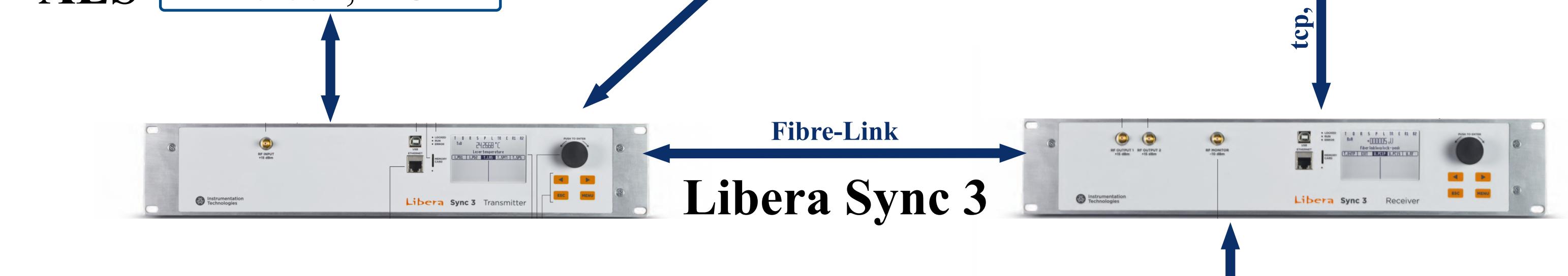
- Developed within Xcode framework
- Written in Objective-C
- Installable from the AppStore as “iFEL”
- Uses standard protocol https

Laser Beam Profiling

- DIAS PyroView-Camera ($8 \mu\text{m}$ - $14 \mu\text{m}$, fix triggerRate, moderate costs)
- Spiricon Pyrocam IV ($1 \mu\text{m}$ - 3 mm , external trigger, expensive)
- Gigabit Ethernet, GigE Vision compliant (Genicam)
- Can be used with EPICS areaDetector-framework and aravisLib



AES RF - clock, 3 GHz



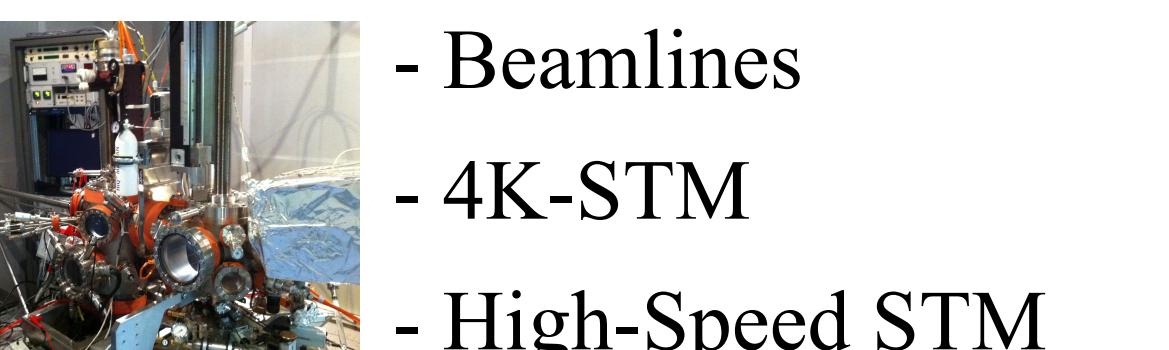
Timing System

- Provides user station with jitter free micro pulses (1 ps)
- Self sustaining, long term stability
- Integrated into the EPICS control system (SCPI commands)

References

- Schöllkopf, W, et al., “The new IR and THz FEL Facility at the Fritz Haber Institute in Berlin” Proceedings of SPIE Vol. 9512, 9512L (2015)
- EPICS archiver appliance: <http://epicsarchiverap.sourceforge.net>

FHI User stations/experiments



Beamlines

4K-STM

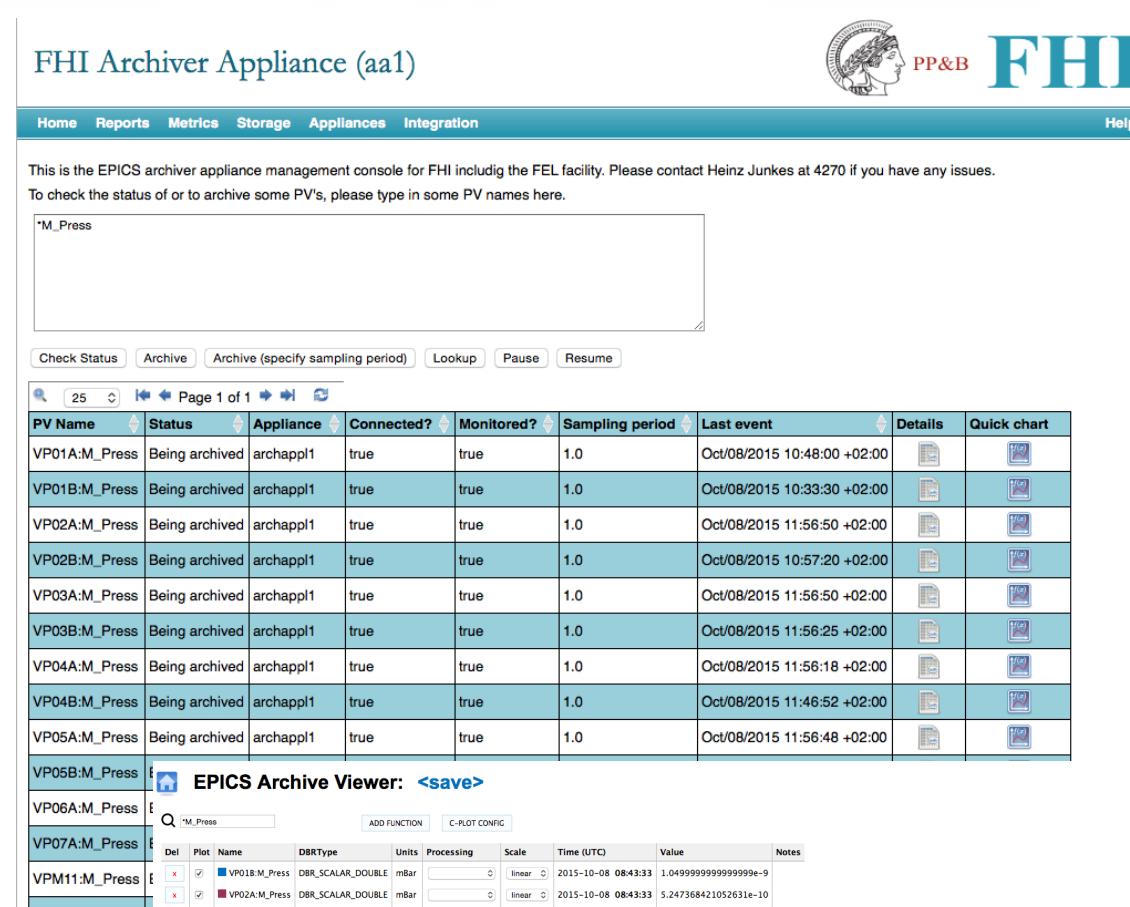
High-Speed STM

- Storage gateway
- Archive / long-term data retention
- Vendor neutral
- Data portability - self-describing LTFS

EPICS Archiver Appliance

EPICS Archiver Appliance

- Ability to cluster appliances
- Scalable by adding appliances to the cluster
- Focus on data retrieval performance
- Able to archive millions of PVs
- Can archive waveforms
- Developed at SLAC by Murali Shankar



ifel

- Gateway (https <-> channel access)
- User authentication, data cache
- Apache, php, perl, mysql

FEL-LAN

