MATTER AND TECHNOLOGIES

Contribution ID: **37** Type: **Poster**

Large-Scale Optical Synchronization System of the European XFEL

At the European XFEL, a facility-wide optical synchronization system providing a femtosecond-stable timing reference at more than 40 end-stations has been developed and installed. The system is based on an ultra-stable optical master laser oscillator, whose signals are distributed via actively length-stabilized optical fibers to different locations across the accelerator and experimental areas. These signals are used to locally re-synchronize radio-frequency sources, to precisely measure the arrival time of the electron beam for fast beam-based feedbacks, and to phase-lock optical laser systems used for electron bunch generation, beam diagnostics and pump-probe experiments with femtosecond temporal resolution. Here, we present the system's architecture and performance as well as design choices required to implement an extensible, large-scale synchronization infrastructure for accelerators that meets reliability, maintainability and femtosecond performance requirements.

Primary author: Mr LAMB, Thorsten (DESY)

Co-authors: Mr SYDLO, Cezary (DESY); Mr ZUMMACK, Falco (DESY); Dr SCHLARB, Holger (DESY); Mr MUELLER, Jost (DESY); Mr FELBER, Matthias (DESY); Mr TITBERIDZE, Mikheil (DESY); Dr SCHULZ, Sebastian (Deutsches Elektronen-Synchrotron); Mr KOZAK, Tomasz (DMCS)

Presenter: Mr LAMB, Thorsten (DESY)

Track Classification: ARD