SP5: Feedback Control for Optical Synchronization

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The European X-ray Free Electron Laser will allow scientists to perform experiments with an atomic scale resolution.

To make this experiments possible, a laser-based synchronization system is used to synchronize all subsystems of the facility with a femto-second precision.

In this system a Master Laser Oscillator generates a pulse train which is distributed via a length stabilized optical fiber to the different subsystems. At those, the pulse train is e.g. used to synchronize a locally used laser oscillator.

This contribution will show the laser synchronization scheme and the universal laser locking firmware from a control theory point of view. This scheme is used for the Master Laser Oscillator and will be used for Laser to Laser synchronization at different subsystems.

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