



Contribution ID: 153

Type: Contributed poster

The Soft X-ray Laser (SXL) project at the MAX IV: Accelerator and FEL

Monday, June 25, 2018 6:45 PM (15 minutes)

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A design study of a Soft X-ray Laser (SXL) at MAX IV laboratory has recently been funded. The case will be developed during a two-year period starting in spring 2018.

The SXL is a FEL targeting 1- 5 nm and will be powered by the MAX IV 3 GeV linac, which is already routinely used for injecting the two storage rings and for the Short Pulse Facility.

The design work will cover several work packages including Accelerator systems, FEL to beamlines and experimental stations, where this abstract focuses on the first two.

As envisaged by users, the baseline design is a SASE FEL able to produce radiation in the range 1-5 nm with variable polarization, but also including double pulse and two colour operation. In the design work coherence improvements will be addressed by exploring more advanced configurations like mode-locking/high-brightness SASE. Ultra-short pulses will also be an area of interest for a future development of the facility and their feasibility will be analyzed during the design study.

The MAX IV injector and linac will also be benchmarked during the progress of the design project to verify and prepare the operation suitable for free electron laser operation.

*) This project is partly funded by the Knut and Alice Wallenberg foundation.

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Session Classification: Poster session