Summer Student Seminars

Report of Contributions

Contribution ID: **0** Type: **not specified**

Simulations of Rod-Grating Structures

Tuesday, 27 September 2016 15:00 (20 minutes)

Simulation studies for a rod-grating structure driven by THz pulses will be presented in my slides. At first, geometry optimizations are performed in order to get the optimum rod-grating structure for acceleration of relativistic electrons. It is followed by detailed wakefield study for an optimum 100-period structure. Simulations were performed using the VSim, for parameters of the ACHIP experiment in SwissFEL, a planned x-ray free electron laser (FEL) facility to be located at the PSI, Switzerland. Finally, a linearly polarized THz pulse is introduced to interact with the SwissFEL bunch in the optimum structure. The achievable beam quality is analyzed in terms of emittance, energy spread and loaded accelerating gradient.

Presenter: Mr WEI, Yelong (Cockcroft Institute)

Contribution ID: **1** Type: **not specified**

Free-electron-laser simulations for the soft X-ray beamline of SwissFEL

Tuesday, 27 September 2016 15:20 (20 minutes)

SwissFEL is a X-ray free-electron laser (FEL) facility at the Paul Scherrer Institut that will serve two beamlines: 1) Aramis, a hard X-ray beamline with a wavelength range between 0.1 and 0.7 nm that it is presently under commissioning, and 2) Athos, a soft X-ray beamline expected to provide FEL radiation by 2020 for wavelengths between 0.65 and 5 nm. In this talk FEL simulations for the Athos case will be presented. The beamline consists of 16 undulator modules, each of them with a period of 38 mm and a total length of 2 m. Simulations for the standard Self-Amplified Spontaneous Emission (SASE) case with planar and helical undulators will be shown. Moreover, simulations for the optical klystron configuration, in which magnetic chicanes are used to reduce the FEL saturation length, will be presented. Finally, optimizations of the undulator tapering to maximize the FEL energy will be shown.

Presenter: Mr FESER, Fabio (PSI)

Contribution ID: **2** Type: **not specified**

Measurement of the resolution of an in-vacuum microscope

Tuesday, 27 September 2016 15:40 (20 minutes)

The electron beam in SwissFEL planned to be used for the accelerator on chip experiments is extremely small (<1um) in order to pass through the dielectric structure. Therefore an adequate diagnostic setup to measure its transverse size needs to be developed and characterized.
The setup to perform such measurements consists of a combination of a infitilely corrected microscope lens and an objective to image the sample on a camera. It will be used to image the transverse beam profile on a scintillator screen.
The aim of the study I took part was to compare the performance of different cameras, objectives and microscope objectives for the final setup. In my presentation I will discuss the approach I followed for performing the measurements and the results obtained in the different cases. The figure of merit I used is the modulation transfer function (MTF) of the detection system.

Presenter: Ms SIEGLER, Marie (PSI)

Contribution ID: **3** Type: **not specified**

Modeling of the acceleration of protons in a dielectric structure

Tuesday, 27 September 2016 16:00 (20 minutes)

Presenter: Mr KELLERMEIER, Max (ETHZ)