Contribution ID: **78** Type: **not specified**

Software Tool for Automatization of Beamlines

Performing an experiment at the European XFEL requires the tuning of several components, including mirrors and motors, with the goal of ensuring that the beam is accurately aligned to the sample for a given choice of experimental parameters. However, this process reduces considerably the time used to collect data, and therefore the chances of success in addressing a given scientific question. Additionally, if there are inaccuracies in the beamline alignment, the data quality suffers significantly. To address these challenges, we aim at automating and improving the alignment of beamlines, which is crucial to maximize scientific output of the European XFEL. To that end, it is critical to obtain simple simulations, such as of the X-ray beam, in order to develop and validate methods for beamline alignment.
In detail, this project entails the development of a software tool, which would perform simulations of the variation of the beam characteristics (e.g., position and width) relative to the injected sample. The resulting data can then be used to test a set of optimization techniques. Such tool would aim at a simple statistical simulation and not a full-fletched beam dynamics simulation. It would also aim at providing the capability for future extensions, such that it may become more realistic. Time allowing, the project may also include a preliminary comparison of standard methods for beamline optimization using simulations, but this is kept as an optional step.

Group

XFEL

Project Category

B1. Physics Data Analysis and Performance (software-oriented)

Special Qualifications

Primary author: Dr GELISIO, Luca