

ID: 1890 - WEPSO57 Optimization of a Dedicated Bio-imaging Beamline at the European X-ray Fel

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Abstract We recently proposed a basic concept for design and layout of a dedicated undulator source for bio-imaging experiments at the European XFEL. Here we present an optimization of that concept. The core of the scheme is composed by soft and hard X-ray self-seeding setups. Using an improved design for both monochromators it is possible to increase the design electron energy up to 17.5 GeV in photon energy range between 2 keV and 13 keV, which is the most preferable for life science experiments. Operating at such high electron energy one increases the X-ray output peak power. Moreover, 17.5 GeV is the preferred operation energy for SASE1 and SASE2 users. This choice will reduce the interference with other undulator lines. We include a study of the performance of the self-seeding scheme accounting for spatiotemporal coupling caused by the use of a single crystal monochromator. This distortion can be easily suppressed by the right choice of diamond crystal planes. The proposed undulator source yields about the same performance as in the case for a X-ray seed pulse with no coupling. Simulations show that the FEL power reaches 2 TW in the 3 keV - 5 keV photon energy range.

Type of Presentation Poster

Main Classification Seeding FELs