

ID: 1889 - WEPSO20 Wake Monochromator in Asymmetric and Symmetric Bragg and Laue Geometry for Self-seeding the European X-ray FEL

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Abstract We discuss the use of self-seeding schemes with wake monochromators to produce TW power, fully coherent pulses for applications at the dedicated bio-imaging beamline at the European X-ray FEL, a concept for an upgrade of the facility beyond the baseline previously proposed by the authors. We exploit the asymmetric and symmetric Bragg and Laue reflections (sigma polarization) in diamond crystal. Optimization of the bio-imaging beamline is performed with extensive start-to-end simulations, which also take into account effects such as the spatio-temporal coupling caused by the wake monochromator. The spatial shift is maximal in the range for small Bragg angles. A geometry with Bragg angles close to $\pi/2$ would be a more advantageous option from this viewpoint, albeit with decrease of the spectral tunability. We show that it will be possible to cover the photon energy range from 3 keV to 13 keV by using four different planes of the same crystal with one rotational degree of freedom.

Type of Presentation Poster

Main Classification Seeding FELs