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## Numerical simulations of harmonic lasing at SASE2 beamline of European XFEL

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In high-gain free-electron lasers (FELs) with planar undulators it is possible (in the linear regime) to independently amplify at the fundamental and at odd harmonics, a process referred to as Harmonic Lasing (HL). For the HL process preservation of the quality of the incoming high-brightness electron beam is essential. This requires suppression of the lasing at the fundamental, which can be achieved using several methods such as special phase shifter set points and attenuation of the fundamental radiation using intra-undulator optical high-pass filters. The European XFEL variable-gap undulator beamline SASE2 features two intra-undulator stations combining a magnetic chicane and the possibility to insert a thin diamond crystal onto the optical axis of the beamline. While installed for the operation in hard x-ray self seeding (HXRSS) mode, this hardware is well-suited for HL experiments at a low electron beam energy corresponding to a fundamental photon energy of about 2keV. In this contribution we present numerical simulations of third-harmonic lasing at this working point.

### Footnotes

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LaTeX

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