



Contribution ID: 1452 Contribution code: TUPL102

Type: **Poster Presentation**

Waveguide FEL oscillator simulation with toroidal mirror

Tuesday, 9 May 2023 16:30 (2 hours)

FEL oscillator is the main working mode to produce infrared and THz radiation. However, in the long wavelength range, the waveguide is essential to suppress the diffraction losses. We have developed a method to study this effect by wGenesis that is modified with Genesis in combination with OPC code. However, this method is limited by the optical elements given in OPC. In this paper, we tried to give a more general optical element case based on the ABCD matrix. Then the simulation based on FELiChEM parameter is done to reduce the truncation loss at the waveguide port by choosing proper toroidal curvature radius. The results show that output power can be increased about 6.4 times than spherical mirror.

Funding Agency

Footnotes

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Yes

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Session Classification: Tuesday Poster Session

Track Classification: MC2: Photon Sources and Electron Accelerators: MC2.A06: Free Electron Lasers