Contribution ID: **2282** Contribution code: **MOPL137**   Type: **Poster Presentation**

Magnetic lattice of PolFEL linac

Monday, 8 May 2023 16:30 (2 hours)

The project of PolFEL free electron laser comprises 185 MeV cw-linac furnished with ASG electron gun and 4 Rossendorf-like cryomodules. Magnetic lattice has been designed applying alike air cooled quadrupole magnets. FODO quadrupoles in undulator section differ with trimmed coils. A variety of dipoles has been designed: 14 –degrees air and water cooled rectangular dipoles are used for low and high energy bunch compressors. 17 - degrees dipoles guide the beam towards a dump. The design of these dipoles bases on identical yoke, furnished with adequate coils and vacuum chambers. 45- degrees water cooled dipoles form a transfer section between FEL and Inverse Compton Scattering parts of the linac. Quadrupole poles design assumed parasitic multipoles strengths less than 10-4 relative to the main one. Dipoles field was assumed uniform within 10-4 of B0. Yokes and poles designs have been performed using 2D FEMM code and refined in 3D with Radia. Manufacturing of yokes and coils will be achieved in NCBJ workshop. Currently, the quadrupole prototype has been built and will be mechanically, electrically and magnetically verified.

Funding Agency

Footnotes

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Yes

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Session Classification: Monday Poster Session

Track Classification: MC1: Colliders and other Particle Physics Accelerators: MC1.A08: Linear Accelerators