



Contribution ID: 2718 Contribution code: WEPL193

Type: **Poster Presentation**

Russian quadruplet based electron optics for ultrafast electron microscopy

Wednesday, 10 May 2023 16:30 (2 hours)

With the development of Mega-electron-Volt ultrafast electron diffraction technology, electron microscopy based on photocathode radio-frequency (RF) electron guns has become a promising tool for high spatiotemporal resolution and shows obvious advantages of suppressing the space charge effect. An ultrafast electron microscopy is being developed at HUST. Russian quadruplet (RQ) based electron optics is selected to achieve simultaneous focusing and equal magnification in both vertical and horizontal directions. The RQ exit beam position must be highly dependent on the entrance beam position and independent of the entrance beam divergence to achieve a point-to-point image, which defines the first-order transfer matrix parameters. COSY INFINITY code is implemented for optics design. The simplified hard-edge model, the fringe field effects, and high-order lens aberrations are discussed and further optimized for the electron beam optics design.

Funding Agency

National Natural Science Foundation of China (12235005), National key research and development program of China 2022YFA1602202; State Grid Corporation of China Technology Project 5400-202199556A-0-5-Z

Footnotes

I have read and accept the Privacy Policy Statement

Yes

Primary author: YUAN, Yi (Huazhong University of Science and Technology)

Co-authors: WANG, Jian (Huazhong University of Science and Technology); YANG, Jinfeng (Osaka University); FAN, Kuanjun (Huazhong University of Science and Technology); LIU, Zhengzheng (Huazhong University of Science and Technology)

Presenters: FAN, Kuanjun (Huazhong University of Science and Technology); YUAN, Yi (Huazhong University of Science and Technology)

Session Classification: Wednesday Poster Session

Track Classification: MC5: Beam Dynamics and EM Fields: MC5.D01: Beam Optics Lattices, Correction Schemes, Transport