Contribution ID: **1707** Contribution code: **TUPL124** Type: **Poster Presentation**

Electron optics based on quadrupole multiplets for dark field imaging and diffraction with MeV electron beams

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

Ultrafast electron probing techniques offer unique experimental tools for investigating the structural dynamics of ultrafast photo-induced processes in molecular and condensed phase systems. In this work, we propose using the SEALAB Photoinjector's exceptional and versatile electron beam parameters to develop a state-of-the-art facility for ultrafast electron diffraction and imaging (UED and UEI) experiments with high sensitivity in space, energy, and time. We first address the design of an electron lens based on quadrupoles that enables easy switching between diffraction and direct imaging modes with minimal system changes. We compare the performance of the quadrupole-based lens with a simpler solenoid-based lens with similar functionality by calculating their respective aberration coefficients. Furthermore, we introduce the necessary beam-line modifications for enabling dark field imaging in the SEALAB Photoinjector. This development is crucial to achieve high-resolution imaging and enable the study of a wide range of material systems.

Funding Agency

Footnotes

I have read and accept the Privacy Policy Statement

Yes

Primary author: ALBERDI-ESUAIN, Benat (Helmholtz-Zentrum Berlin)

Co-author: KAMPS, Thorsten (Helmholtz-Zentrum Berlin)

Presenter: ALBERDI-ESUAIN, Benat (Helmholtz-Zentrum Berlin)

Session Classification: Tuesday Poster Session

Track Classification: MC2: Photon Sources and Electron Accelerators: MC2.A08: Linear Accelerators