Contribution ID: **1047** Contribution code: **THPL075** Type: **Poster Presentation**

A compact dielectric grating-based charged particle bunch length diagnostic device at ARES

Thursday, 11 May 2023 16:30 (2 hours)

Dielectric gratings are used in Dielectric Laser Acceleration due to their high damage thresholds in high acceleration gradients. When an electron bunch passes close to these gratings, it emits radiation, and the features of this radiation will be dependent on the beam position relative to the grating, the bunch charge, and the bunch length. A compact high-resolution diagnostic device will be developed that consists of multiple dielectric gratings with different periodicities; these types of devices are required for the accurate operation of future compact accelerators which are currently undergoing development and testing.

The ARES linac at DESY is able to provide sub-fs electron bunches and has a range of high-resolution diagnostic devices installed, such as the PolariX Transverse Deflecting Structure, which will allow for performance verification of a new diagnostic. The electron bunches can be altered, allowing for the measurement and analysis of the emitted radiation for different bunch lengths and charges. This work will present the current progress in this area, including the presentation and discussion of simulations, and a discussion of the planned experiments at ARES.

Funding Agency

Footnotes

I have read and accept the Privacy Policy Statement

Yes

Primary author: STACEY, Blae (Deutsches Elektronen-Synchrotron)

Co-authors: ASSMANN, Ralph (Deutsches Elektronen-Synchrotron); HILLERT, Wolfgang (University of Hamburg); KUROPKA, Willi (Deutsches Elektronen-Synchrotron); VINATIER, Thomas (Deutsches Elektronen-Synchrotron)

Presenter: STACEY, Blae (Deutsches Elektronen-Synchrotron)

Session Classification: Thursday Poster Session

Track Classification: MC6: Beam Instrumentation, Controls, Feedback and Operational Aspects: MC6.T03: Beam Diagnostics and Instrumentation