



Contribution ID: 715 Contribution code: WEPC61

Type: **Poster Presentation**

## Concepts for more flexible UED/UEM operation

*Wednesday, 22 May 2024 16:00 (2 hours)*

Ultrafast electron diffraction and microscopy (UED/UEM) has advanced beyond proof-of-concept stage into the realm of instrumentation. To date, most UED/UEMs have been constructed around high-gradient RF-driven electron guns designed as X-FEL beam sources.

A UED/UEM system driven by a CW beam, either normal- or superconducting, offers several potential performance benefits over high-gradient pulsed beam sources. These include the ability to operate at much higher average repetition rates, and the ability to extend measurement times beyond  $O(1 \mu\text{s})$ . If a quarterwave-type beam source is used, there is an additional possibility to vary the time between probe pulses by other than an RF period. In this paper we present the basis for this claim, discuss implications for detectors, and consider also utilization of probe electron beams at different beam energies.

### Footnotes

LA-UR-23-33635

### Funding Agency

Work was performed under the auspices of the US Department of Energy by Triad National Security under contract 89233218CNA000001.

### Paper preparation format

Word

### Region represented

North America

**Primary author:** LEWELLEN, John (Los Alamos National Laboratory)

**Co-author:** SMEDLEY, John (SLAC National Accelerator Laboratory)

**Presenter:** LEWELLEN, John (Los Alamos National Laboratory)

**Session Classification:** Wednesday Poster Session

**Track Classification:** MC2: Photon Sources and Electron Accelerators: MC2.T02 Electron Sources