Contribution ID: **87** Contribution code: **WECI02** Type: **Invited Oral Presentation**

Experimental demonstration of a single-shot, nondestructive electron beam diagnostic based on the ionization of a low-density pulsed gas jet

Wednesday 10 September 2025 13:30 (30 minutes)

7 MeV electron bunches from a radiofrequency photoinjector, carrying up to 100 pC of charge, traversed a localized distribution of nitrogen gas (N2). The interaction of the electron bunches with the N2 gas generated a correlated signature in the ionized particle distribution, which was spatially magnified using a series of electrostatic lenses and recorded with a microchannel-plate detector. Various modalities, including point-to-point imaging and velocity mapping, are investigated. A temporal trace of the detector current enabled the identification of single- and double-ionization events. The characteristics of the ionization distribution, dependence on gas density, total bunch charge, and other parameters, are described. Approaches to scaling to higher electron bunch density and energy are suggested. Additionally, the instrument proves useful for comprehensive studies of the ionization process itself.

Suggested Speaker: P. Denham UCLA
Suggested by: Alessandro Cianchi

Footnotes

Funding Agency

I have read and accept the Conference Policies

Yes

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