



Contribution ID: 1041 Contribution code: THPL067

Type: **Poster Presentation**

## Development and testing of quantum gas jet beam profile scanner

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

A quantum gas jet-based beam scanner is under development at the Cockcroft Institute (CI) in the UK. This device is based on detecting the ionisation induced in a gas jet by a beam of charged particles. It aims at generating a dense gas jet with a diameter of less than 100  $\mu\text{m}$  by exploiting the quantum wave nature of neutral gas atoms to generate an interference pattern with a single maximum. Work analogously to a mechanical wire scanner while being minimally interceptive, a tightly focused gas jet promises superior position resolution and high signal intensity.

This contribution gives an overview of the design and functioning principle of the monitor, presents initial modification in the system for gas density measurement, as well as results from beam profile measurements obtained with a 5 keV electron beam.

### Funding Agency

This work is supported by the STFC grant ST/W000687/1, InnovateUK Germinator project 10004615, the HL-LHC-UK project funded by STFC and CERN, and the STFC Cockcroft Institute core grant ST/V001612/1.

### Footnotes

### I have read and accept the Privacy Policy Statement

Yes

**Primary author:** KUMAR, Narender (Cockcroft Institute)

**Co-authors:** Prof. WELSCH, Carsten (The University of Liverpool); ZHANG, Hao (Cockcroft Institute); MALTUSCH, Ines (Fachhochschule Aachen); WOLFENDEN, Joseph (University of Liverpool); STRINGER, Oliver (Cockcroft Institute); BUTCHER, William (Cockcroft Institute)

**Presenter:** ZHANG, Hao (Cockcroft Institute)

**Session Classification:** Thursday Poster Session

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