



Contribution ID: 93

Type: **Poster Presentation**

## An online 2D Spatial-Resolved Proton Spectrometer based on a Scintillation-Fiber-Cube

Wednesday, 11 September 2024 14:20 (1h 30m)

The applications of proton beams require precise diagnosis of their properties including spectrum and spatial distribution. Distinct from the case of traditional accelerators, limited online detectors are available for laser-driven proton beams with high transient fluence, somewhat impeding the progress in this field.

This paper presents an online proton spectrometer, named Scintillation Fiber Cube Proton Spectrometer (SFCPS), which can diagnose proton beams with sub-millimeter ( $\sim 500$   $\mu\text{m}$ ) spatial resolution and wide fluence range. The SFCPS offers an energy range of approximately 6 $\sim$ 93 MeV with an energy resolution of 0.5% at 80 MeV, as calibrated. We demonstrated the SFCPS's ability to reconstruct the 2D energy spectrum of parallel proton beams with uneven spatial distributions. Further discussion and analysis reveal that the SFCPS's lower detection threshold for proton beams is approximately  $1 \times 10^5$  p/cm<sup>2</sup>.

### Footnotes

### Funding Agency

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

Yes

**Primary author:** SONG, Tan (Peking University)

**Co-authors:** Mr GAO, Ying (Peking University); Mr ZHANG, Yujia (Peking University); ZHAO, Jiarui (Peking University); Mr MA, Wenjun (Peking University)

**Presenter:** SONG, Tan (Peking University)

**Session Classification:** WEP: Wednesday Poster Session

**Track Classification:** MC4: Transverse Profile and Emittance Monitors