

Contribution ID: 176 Contribution code: WEP25

Type: Poster Presentation

# Accurate Beam Spot Fitting Algorithm Using Generalized and Skewed Gaussian Type Distributions

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

To address non-standard Gaussian beam spot pro-files in injectors, this paper proposes a fitting algo-rithm based on Gaussian, the newly introduced Gener-alized Gaussian Type and Skewed Gaussian Type dis-tributions. These distributions are specifically de-signed to better fit non-Gaussian and asymmetric beam spots by auto-matically selecting the most suitable model. Validation using beam spot images from the YAG screen after the electron gun in the Hefei Light Source II (HLS-II) injector demonstrates that the Gen-eralized Gaussian Type is effective for fitting sharp or broad profiles, while the Skewed Gaussian Type is well-suited for handling asymmetry. Compared to tra-ditional methods, the proposed algorithm improves fitting accuracy and adaptability, providing a practical solution for complex beam measurement challenges.

### Footnotes

# **Funding Agency**

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Yes

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Session Classification: WEP: Wednesday Poster Session

Track Classification: MC4: Transverse Profile and Emittance Monitors