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Using Machine Learning to accurately predict the transverse beam profile at CLARA's Interaction Point

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Non-destructive methods for measuring beam qualities like transverse beam profile are at times preferable for a range of reasons, including less down time and more reliability. These methods are, however, not always viable, for example for lack of space at the interaction point, where users typically place instrumentation needed for their experiment. In this paper we present a Machine Learning model to infer the electron beam transverse profile at the interaction point without the need for dedicated diagnostics. For this, we have generated large sets of training data and images using Elegant simulations and plan to test and extend the model using real beam images on CLARA. While focused on the transverse beam profile for now, a longer-term aim is to generalise the Machine Learning algorithm for other beam characteristics.

Footnotes

Funding Agency

I have read and accept the Conference Policies

Yes

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