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Detector parametrisation for the front end test stand laserwire diagnostic using GEANT4

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Comprehensive simulations for the FETS laserwire have been made with the developed Geant4 laser package. Feasibility of the longitudinal mode laser to provide full 6D beam characterisation has been made. Simulation results have been used to outline minimum detector requirements. The detector necessary for measuring the 6D phase space requires a drift distance of at least 2.5m between interaction point and detection plane, a 1mm² spatial resolution, across a total transverse area of 40mm² for the transverse measurements. To include longitudinal data the time resolution of the detector would need to be 200ps or less. The Timepix4 is proposed as a candidate detector due to its tile structure enabling custom size detector, a <100 μm spatial resolution, and a 195 ps time resolution.

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Footnotes

I have read and accept the Privacy Policy Statement

Yes

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