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Betatron radiation based diagnostics for plasma wakefeld accelerated electron beams at the SPARC_LAB test facility

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Beam diagnostics, both longitudinal and transverse, represents a crucial point for Plasma WakeField Acceleration (PWFA) with external injection. Matching conditions for the beam before the injection into the plasma and the preservation of beam quality at the plasma exit, both require precise beam size measurements. Betatron radiation emitted by the beam during acceleration in the plasma represents a valid tool for transverse beam size measurement, being also non-intercepting. In this work we report on the technical solutions chosen at SPARC LAB for such diagnostics tool, along with expected parameters of betatron radiation.

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