

# Issues with phase space characterization of laser-plasma generated electron beams

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Plasma acceleration is the new frontier in particle beam accelerators. Using the strong electric fields inside a plasma it is possible to achieve accelerating gradients orders of magnitude larger with respect to the actual technologies. Different schemes, using completely different approaches, have been proposed and several already tested, producing beams of energy up to several GeV. Independently by the technique a precise determination of the emerging beam parameters is mandatory for the fine tuning of the process. The measurement of these parameters, in particular the phase space, is not trivial, mainly due to the large energy spread and to the tight focusing of these beams or to the background noise produced in the plasma channel. We illustrate the principal problems related to the diagnostic of this kind of beams and some of the proposed or already realized solutions.

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