

Towards Dream Beam: A Personal Perspective on Plasma Based Acceleration

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As an active subfield of plasma physics, plasma based acceleration has made great strides worldwide in the past decade. I was very fortunate to be part of this exciting time and to be able to make my own small contribution. In this talk, I want to present a quite personal perspective about this promising field, with a focus on the future opportunities. Some recent work in my group at Tsinghua University will be presented to serve this purpose. On the theory and simulation part, several ideas on how to obtain high quality electron beams with extremely high brightness through wakefield acceleration will be discussed; On the experiment part, our recent results of high quality electron beam generation with very low energy spread (a new world record: with minimal absolute energy spread of 0.18MeV and relative energy spread 0.8%) will be presented. [1] H. Terças and J.T. Mendonça, Polytronic equilibrium and normal modes in cold atomic traps *Phys. Rev. A*, **88**, 023412 (2013).

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