

High charge, 10-GeV electron bunches from a 10-cm long, nanoparticle assisted, laser wakefield accelerator: our next steps

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We recently demonstrated generation of very high charge (1+ nC), very high energy (10 GeV) electron bunches from a nanoparticle-assisted laser wakefield accelerator [1]. While the experiment did yield record breaking results, the statistics were quite poor due to the very slow repetition rate of the Texas Petawatt Laser system. We are currently on a campaign to repeat and improve upon these results. Here we will report on our improved understanding of the nanoparticle-assist effect as well as the planned experimental program we have laid out.

[1] C. Aniculaesei et al. "The Acceleration of a High-Charge Electron Bunch to 10 GeV in a 10-cm Nanoparticle-Assisted Wakefield Accelerator", Matter Radiat. Extremes 9, 014001 (2024) <https://doi.org/10.1063/5.0161687>

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