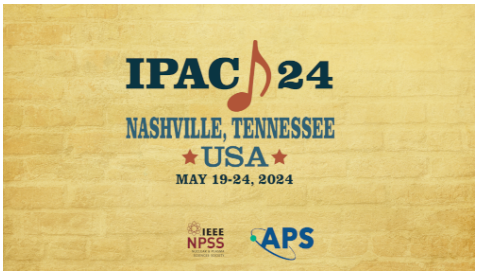

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Laser-plasma injector for an electron storage ring

Monday, 20 May 2024 16:00 (2 hours)

Laser-plasma accelerators (LPAs) are compact accelerators with field gradients that are approximately 3 orders of magnitude higher than RF-based machines, which allows for very compact accelerators. LPAs have matured from proof-of principle experiments to accelerators that can reproducibly generate ultrashort high-brightness electron bunches. Here we will discuss a first combination of LPAs with an electron storage ring, namely an LPA-based injector for the cSTART ring at the Karlsruher Institute of Technology (KIT). The cSTART ring is currently in the final design phase. It will accept electron bunches with an energy of 50 MeV and will have a large energy acceptance to accommodate the comparably large energy spread of LPA-generated electron beams. The LPA will be required to reproducibly and reliably generate 50 MeV electron bunches with few percent energy spread. To that end, different controlled electron injection methods into the plasma accelerating structure, tailored plasma densities are explored and beam transfer lines to tailor the beam properties are designed.

Footnotes

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Region represented

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