Contribution ID: **822** Contribution code: **TUPA073** Type: **Poster Presentation**

Plasma-accelerator-based linear beam cooling systems

Tuesday, 9 May 2023 16:30 (2 hours)

Plasma-based accelerators enable compact acceleration of beams to high energy and are being explored as a potential technology for future linear colliders. Conventional linear colliders require damping rings to generate the required beam emittance for particle physics applications. We present and discuss a plasma-based linear radiation damping system that allows cooling of ultrashort bunches compatible with plasma-based accelerators. The plasma accelerating gradients enable relatively compact linear damping systems, and there is a trade-off between system length and the achievable emittance reduction. Final asymptotic normalized transverse beam emittance is shown to be independent of beam energy. The impact of coherent radiation emission is considered.

Funding Agency

Supported by the Director, Office of Science, Office of High Energy Physics, of the U.S. Department of Energy under Contract No. DE-AC02-05CH11231.

Footnotes

I have read and accept the Privacy Policy Statement

Yes

Primary author: SCHROEDER, Carl (Lawrence Berkeley National Laboratory)

Co-authors: BENEDETTI, Carlo (Lawrence Berkeley National Laboratory); BULANOV, Stepan (Lawrence Berkeley National Laboratory); ESAREY, Eric (Lawrence Berkeley National Laboratory); TERZANI, Davide (Lawrence Berkeley National Laboratory); DUGAN, Gerald (Cornell University (CLASSE))

Presenter: SCHROEDER, Carl (Lawrence Berkeley National Laboratory)

Session Classification: Tuesday Poster Session

Track Classification: MC3: Novel Particle Sources and Acceleration Techniques: MC3.A16: Advanced Concepts