



Contribution ID: 76

Type: **Contributed Oral**

## **Plasma-accelerator-based linear beam cooling systems**

*Thursday, 10 November 2022 10:30 (20 minutes)*

Plasma-based accelerators enable compact acceleration of beams to high energy and are considered a potential technology for future linear colliders. Conventional linear colliders require damping rings to generate the required beam emittance for high-energy physics applications. We propose and discuss a plasma-based linear radiation damping system that allows cooling of ultrashort bunches compatible with plasma-based accelerators, potentially removing the need for bunch compression. The ultra-high 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 beam emittance is shown to be independent of beam energy.

### **Acknowledgments**

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.

**Primary authors:** SCHROEDER, Carl (LBNL); TERZANI, Davide (LBNL); BENEDETTI, Carlo (LBNL); BULANOV, Stepan (LBNL); ESAREY, Eric (LBNL); DUGAN, Gerry (Cornell University)

**Presenter:** SCHROEDER, Carl (LBNL)

**Session Classification:** WGs 5+7 Joint Session

**Track Classification:** Working Group Parallel Sessions: WG7 Oral: Radiation Generation and Advanced Concepts