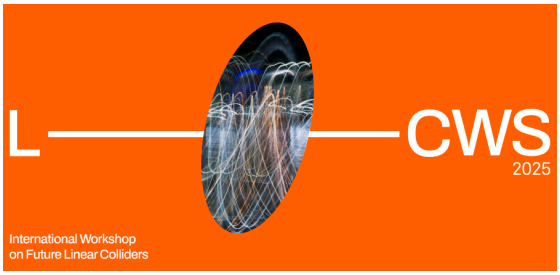

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Design considerations for a laser plasma accelerator based linear collider

Tuesday 21 October 2025 09:40 (20 minutes)

Laser-driven plasma accelerators have demonstrated single-stage acceleration of electron beams up to 10 GeV over tens of cm, and these compact laser-plasma accelerating structures offer the potential to reduce the size and cost of a future energy-frontier linear collider. In this presentation, I will discuss the design considerations for the application of laser-driven plasma-based accelerator technology for a multi-TeV linear collider. Key to the realization of the collider application is the development of high average and high peak power laser systems, operating with high efficiency. Coherent combination of fiber lasers is a promising solution to achieve high average and high peak power lasers suitable for high-energy physics applications, and I will describe recent progress on laser technology. I will also discuss gamma-gamma colliders at multi-TeV, as well as application of laser-plasma technology as an upgrade to RF linear colliders.

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