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Advancements in Beam Delivery Systems: CLIC Innovations and Plasma Collider Applications

Wednesday, 10 July 2024 15:00 (15 minutes)

This talk presents the latest developments in beam delivery systems (BDS) for the Compact Linear Collider (CLIC) and their applications in plasma colliders. The CLIC's BDS has undergone significant refinements to address challenges in minimizing beam size, correcting chromatic aberrations, and maintaining stability at high energies (380 GeV and 3 TeV). Key innovations include the integration of detector solenoid effects and the implementation of a dual BDS concept. This concept effectively manages larger crossing angles and the associated luminosity losses, which are critical at energies up to 3 TeV. Furthermore, the extension to a proposed 7 TeV CLIC BDS design anticipates the requirements of future colliders, focusing on trajectory bending minimization and chromaticity correction. Collaborations with plasma collider projects like Laser Plasma Accelerators (LPA) and Hybrid, Asymmetric, Linear Higgs Factory (HALHF) highlight synergistic solutions to shared technical challenges, notably in emittance preservation and energy spread control. These collaborations are pivotal in advancing the understanding of beam dynamics and delivery, setting a robust foundation for next-generation particle collider designs.

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