

Physics and Applications of High Brightness Beams



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A review of positron acceleration in plasma

Plasma accelerators for future linear lepton colliders have been considered as a potential upgrade in accelerator technology. However, in recent years, the challenge in accelerating positrons in plasma has diverted much attention to other collider options. Many new ideas emerged with the concept of modifying the plasma or the drive beam to overcome this challenge. In this contribution, we review the ultimate positron problem in plasma, along with the historical and present efforts on the topic. In addition, several proposals on different acceleration schemes are outlined. A parameter that scales with the collision luminosity per beam power is used to compare the proposed schemes. Finally, the proposed schemes are ranked with respect to the scaling parameter and discussed in terms of their potential and compatibility with high-energy colliders.

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