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Simulating Beam-Beam Collisions in Linear Colliders Using Particle-in-Cell Methods

Monday, 8 May 2023 16:30 (2 hours)

The AAC community proposed linear collider concepts with energies extending to 15 TeV center-of-mass and luminosities up to $50 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$ as part of the Snowmass process. The beam power required to reach these energies and luminosities is prohibitive. We discuss the results of initial investigations of strategies to increase luminosity per beam power, a key figure-of-merit for linear colliders. We deploy a new tool for our studies, Particle-in-Cell simulations, in order to better understand collisions at high-energy and high-beamstrahlung parameters. The results of our studies will aid in the design of future linear colliders based on standard RF technologies and novel acceleration methods.

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Footnotes

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Yes

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