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Future Linear Collider Applications with Laser-Driven Dielectric Structures

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The dielectric laser acceleration (DLA) concept leverages well-established industrial fabrication capabilities and the commercial availability of tabletop lasers to reduce cost, while offering significantly higher accelerating gradients, and therefore a smaller footprint. In contrast to other novel accelerator schemes, desirable luminosities would be obtained by operating with very low charge per bunch but at extremely high repetition rates. This research has signficant near and long-term applications, which we will discuss. And as a consequence of its unique operating parameter regime, the predicted energy loss due to beam-beam interaction is small.

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