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Advanced acceleration schemes for e+e - colliders[1]

TOR RAUBENHEIMER, SLAC National Accelerator Laboratory

The physics case for a TeV-scale electron-positron linear collider has been endorsed by the international high energy physics community. In support of this physics program, the International Linear Collider Global Design Effort (ILC-GDE) has developed a detailed design for a 500 GeV collider based on 1.3 GHz superconducting rf cavities that would operate at 35 MV/m. At the same time, the international accelerator R&D program has been pursuing a number of alternate technologies that may achieve higher acceleration gradients and may offer access to an increased energy range. These technologies include rf-driven and beam-driven high gradient normal conducting accelerator systems, laser-driven and beam-driven dielectric accelerators and laser-driven and beam-driven plasma accelerators. These alternate technologies have the potential for much higher acceleration gradients than the ILC design with gradients ranging from 100 to 30,000 MV/m and would potentially be less costly per GeV. This talk will discuss the present status of these alternate technologies, describe their potential advantages and risks, and consider the development timelines. The talk will also cover some of the near-term applications of these technologies including accelerators for Free Electron Lasers or compact linacs for medicine or industry.

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