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Progress with Laser Plasma Wakefield Acceleration and Prospects of LPWA HEP Colliders

Friday, August 12, 2011 8:00 AM (30 minutes)

Accelerators are essential tools of discovery and have many practical uses. More than three decades ago, lasers were proposed as power sources for driving novel accelerators based on plasmas as the accelerating medium. An overview will be presented of the basic principles of laser plasma accelerators (LPA) and of the research at LBNL. This includes the 2004 demonstration of high quality electron beams, the 2006 demonstration of GeV class beams from a 3 cm long accelerating structure, recent work on controlled injection, staging of modules and the BELLA project which aims at a 10 GeV meter scale accelerator. We then discuss the challenges of this technology towards applicability for advanced light sources and colliders.

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