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Status of the PWFA experiment FLASHForward

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Beam-driven plasma-wakefield acceleration (PWFA) is a promising technology for future accelerator facilities, where a high electric field gradient could shrink the size, reduce the cost or/and provide highest beam energies. Successful experimental results in recent decades have demonstrated the feasibility of high-gradient acceleration in plasma. However, to meet the demands of current conventional accelerator users in terms of luminosity and brightness, there are more milestones to reach. Preservation of beam quality, high overall energy-transfer efficiency, and high-average-power operation are the three major research pillars of the PWFA experiment FLASHForward at DESY. In this submission an overview of the facility and recent results –per-mille-level energy-spread preservation; high energy-transfer efficiency of 42% from the wake to the accelerating bunch; and the in-principle operation of plasma accelerators at O(10 MHz) inter-bunch repetition rates– are presented.

Collaboration / Activity

PWFA

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