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Driver/witness bunch PWFA experiments at FLASHForward

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Owing to high gradient accelerating fields ($>GV/m$), plasma wakefield accelerators (PWFA) have the high potential of greatly reducing the size of high-average power accelerator facilities. The stability and quality of the acceleration process in the plasma largely depends on the incoming bunch structure. A precise control of the longitudinal bunch profile is essential for the optimisation of the energy transfer efficiency and the preservation of energy spread. At FLASHForward, driver/witness bunch pairs of adjustable bunch length and separation are generated by collimators in a dispersive section. This setup enables μm -level control of the longitudinal bunch profile. Here we present the most recent results of PWFA measurements at FLASHForward.

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