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Commissioning strategies of hollow electron lens residual kick compensation

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Hollow electron lenses (HELs) could be used in the HL-LHC to selectively remove halo particles from the circulating beams. While the ideal design should leave particles in the beam core unaffected, in reality, the core particles will be exposed to a small residual kick that could induce transverse emittance blowup if not properly compensated while the HEL is operated in pulsed mode. One possible solution would be to couple the HEL pulse with the adjacent HL-LHC transverse damper (ADT). The principle consists of exerting an oppositely directed kick with the ADT at each turn the HEL is switched on, thus compensating the HEL residual kick on the beam core. In this contribution, we simulate the performance of this compensation scheme and possible commissioning scenarios, aiming at reliably setting up the compensation scheme when the direction and amplitude of the residual kick are, a priori, unknown.

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Footnotes

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