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Trapping of sub-relativistic particles in laser driven accelerators

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We investigate the longitudinal and transverse dynamics of sub-relativistic electrons during the trapping process, as facilitated by an adiabatically tapered dielectric structure. The characteristics of the trapped electrons are studied for different initial conditions and structure's parameters. A set of optimal parameters that exemplify our approach are presented. Specifically, we determine the condition where the transverse emittance is preserved during the trapping process. *Published by AIP Publishing*. https://doi.org/10.1063/1.5005031