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Controlled and combined injection schemes for laser wakefield accelerators

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The electron injection process is crucial to the performance of a laser wakefield accelerator as a whole. Here we present recent results and scalings for several controlled injection schemes, i.e. ionization-induced injection, shock-front injection and colliding pulse injection. We demonstrate that the combination of ionization-induced injection and shock-front injection permits the reliable generation of quasi-monoenergetic electron beams. Furthermore, shock-front injection and colliding pulse injection can be used simultaneously, leading to tunable, dual-energy electron beams.

Summary

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