

Taming the complexity of laser plasma accelerators

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Laser plasma acceleration is transitioning from basic research to application and this transition is not finished. At the one side of the spectrum, new experimental techniques and facilities enable a first look on the acceleration dynamics with atomic resolution.

On the other hand, simulations of the fundamental process are reaching predictive capabilities in both laser-driven electron and ion acceleration.

Yet, this is still only true for a limited set of cases and a more general approach requires new approaches to transition to reliable and useable laser-driven particle beam sources.

We argue that besides progress in the fundamental understanding of the underlying plasma processes accompanying techniques that enhance our capabilities to better understand real world experiments are timely and needed to push laser plasma acceleration closer to application.

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