



Ultrafast Intense laser technology and plasma based accelerator research at Tsinghua University

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In this talk, several key progresses regarding ultrafast intense laser technology and plasma based accelerator research at Tsinghua University will be presented. These include the first demonstration of staging experiment between a Linac and a LWFA with near 100% capturing efficiency, the first plasma dechirper experiment shows the promises of reducing energy chirp from 1% level down to 0.1% level[1], and a scheme and its experimental demonstration for generating single cycle relativistic intense infrared pulse in the 4-20um wavelength range utilizing photon deceleration in a specially designed plasma structure[2]. Furthermore, a compact laser development program focusing on applications will also be introduced.

[1]“Phase Space Dynamics of a Plasma Wakefield Dechirper for Energy Spread Reduction,” PRL 122, 204804 (2019)

[2]“Relativistic single-cycle tunable infrared pulses generated from a tailored plasma density structure,” Nature Photonics, VOL 12 | AUGUST 2018 | 489–494 (cover story)