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Synchronization of ebeam and laser beam in 'Trojan horse' plasma wakefield experiment

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We observed Electro_Optic Sampling(EOS) signals on ZnTe and GaP with different thicknesses. The critical step for "Trojan horse" plasma wakefield acceleration experiment (E210) in FACET is to synchronize electron beam and laser beam at hundreds of femtosecond level to guarantee laser is injected into plasma bubble generated by driver bunch. EOS is a reliable technique to synchronize beams and has been applied in THz experiment for years. In our experiment, we are able to estimate ebeam bunch length from EOS signal width and compare result with TCAV measurement. Also, we explored the effect of TCAV and phase ramp on timing.

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