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## Electro-optic sampling based electron beam measurements

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A major challenge for any experiment involving laser - electron beam interaction such as Compton scattering, dielectric laser acceleration or ponderomotive bunching is spatiotemporal overlap of the pulses. In this paper, we demonstrate how a simple electro-optic sampling setup can be used as a tool to read out the spatiotemporal overlap of an electron bunch and laser pulse. By using an intercepting geometry where the electron beam is sent directly into the electro optic ZnTe crystal, the induced fluorescence signal is imaged onto a CCD camera allowing for beam spotsize measurements concurrently with the time-information extracted by EOS analysis. This is then used to reconstruct the full longitudinal and transverse shape of the electron bunches allowing beam analysis for future experiments that require laser - electron beam interactions. At the UCLA Pegasus beamline, the setup is used to study velocity compression of a low charge 4-6 MeV beam using an RF cavity. We show a clear EOS signal even at beam charges below 1 pC, owing to the strong electric field of the fully compressed e-beam.

### Working group

WG5 : Beam sources, monitoring and control

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