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Modelling of electro-optic sampling for the study of laser-wakefield acceleration

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In the context of electron sources produced by laser-wakefield acceleration (LWFA), the temporal evolution of generated electron bunches is a key parameter. Detection of electrons' arrival time and longitudinal profile is needed to characterise the source. Among other diagnostic methods, electro-optic sampling enables to measure electron bunch distribution and arrival time non-destructively and in a single shot. It is a well-known approach for conventional accelerators, but the technique needs to be adapted to short-duration electron bunches obtained by laser-plasma acceleration. In this poster, I will present the results of analytical modelling of electro-optic diagnostics as well as a setup for a high-quality electron LWFA scheme.

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