

Abstract Submitted  
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**Electro-Optic Detection of Ultrashort Electron Beams Produced in Laser Wakefield Accelerators**<sup>1</sup> MICHAEL HELLE, Georgetown University, DANIEL GORDON, DMITRI KAGANOVICH, ANTONIO TING, U.S. Naval Research Laboratory — Electro-Optic (EO) detection is a non-invasive technique to measure the longitudinal profile of relativistic electron bunches. To extend this technique to ultrashort electron beams (<10 fs) produced in laser wakefield accelerators many of the assumptions used to describe EO detection are no longer valid. Current EO detection schemes avoid material resonances and assume that the effect of the electric field on the probe beam can be described purely as a Pockels effect. Unfortunately, material resonance cannot be avoided and the assumption of Pockels effect cannot be made when dealing with the ultrashort beams produced in a laser wakefield accelerator. Theoretical, simulation, and experimental work is being done at the U.S. Naval Research Laboratory to address these effects and extend EO detection to the measurement of ultrashort electron bunches. Current results will be discussed.

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