

Abstract Submitted  
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**Betatron radiation calculation and application for electron beams accelerated in laser plasma accelerators**<sup>1</sup> M. CHEN, C.G.R. GEDDES, G.R. PLATEAU, E. ESAREY, C.B. SCHROEDER, S.S. BULANOV, C. BENEDETTI, W.P. LEEMANS, LOASIS program, Lawrence Berkeley National Laboratory, LOASIS TEAM — Due to the unique trajectory character of the electrons accelerated in a laser wakefield accelerator (small strength parameter  $K$  and small betatron oscillation number  $N_\beta$ ), the radiation from these electrons cannot be simply estimated by the usual asymptotic formulas which is used in wiggler radiation devices. A new parallel code named “Virtual Detector for Synchrotron Radiation” (VDSR) has been made and used for radiation calculations in laser plasma accelerators. Differences between VDSR calculations and the asymptotic formula are shown. Radiation characteristics of accelerated electron beams from different injection schemes (self-injection and colliding pulse injection) are compared. Comparison of radiation calculations with data are also used to infer electron beam parameters which cannot be obtained from other typical diagnostic methods in experiments, such as beam bunch size and emittance.

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