Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Strong radiation damping effects in a gamma-ray source generated by the interaction of a high intensity laser with a wakefield accelerated electron beam[1] ALEXANDER THOMAS, University of Michigan, CHRISTOPHER RIDGERS, University of Oxford, STEPAN BULANOV, Lawrence Berkeley National Laboratories, BLAKE GRIFFIN, University of Michigan, STUART MANGLES, Imperial College London — We present numerical calculations of the angularly resolved radiation spectrum from a relativistic electron beam interacting with an ultrashort laser pulse. These calculations include the effect of semi-classical radiation reaction forces including a Gaunt factor for synchrotron radiation. For a laser of 5×10^{21} Wcm^{-2} intensity interacting with a 200 MeV electron beam with an emittance similar to that in laser wakefield acceleration experiments, radiation reaction does not produce a significant change in the angular and energy distribution of *photons*. However the effects of radiation reaction are clear when observing the *electron beam* properties. The result is that near-term experiments using such a counter-propagating beam-laser geometry should be able to measure the effects of quantum effects in radiation reaction. The calculations also show that the brilliance of this source is very high, with a peak spectral brilliance exceeding 10^{29} photons s^{-1}mm^{-2}mrad^{-2}(0.1% bandwidth)$^{-1}$ with approximately 2% efficiency and with a peak energy of 10 MeV.

[1]This work was funded by the NSF under contracts 1054164 and 0935197, DARPA under contract N66001-11-1-4208, EPSRC (Grant numbers EP/I014462/1 and EP/G055165/1) and the Royal Society.

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Date submitted: 23 Jul 2012 Electronic form version 1.4