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Photoemission by Large Electron Wave Packets MICHAEL WARE, JUSTIN PEATROSS, ERIC CUNNINGHAM, Brigham Young University — The quantum wave packets of free electrons naturally spread, quickly reaching the scale of optical wavelengths. Moreover, electron wave packets born through ionization in an intense laser focus are pulled apart by sharp field gradients. Different parts of the same electron wave packet may even be propelled out opposite sides of the laser focus. The question naturally arises as to how wave packets scatter laser radiation if they undergo such highly non-dipole dynamics. At least two approaches have been used to analyse this problem in the literature, which give differing predictions for radiation strength. We provide an update on an experimental effort to measure the radiation from individual electron wave packets that are spread over an area on the scale of an optical wavelength.

Michael Ware
Brigham Young University

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