

Abstract Submitted
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The Impact Parameter Dependence of Heavy Ion Lepton Pair Production to All Orders in $Z\alpha$ ANTHONY J. BALTZ, Brookhaven National Laboratory — The impact parameter dependence of the ultrarelativistic exact Dirac equation solution of heavy ion electron and muon pair production has been investigated. The exact formulation obtained differs from perturbation theory in such a way that the usual Feynman integral techniques cannot be used for the intermediate photon integral in the impact parameter dependent amplitude. Therefore a piecewise analytic numerical technique has been exploited. The total probability for electromagnetic pair production is found to be smaller than the perturbation theory result for both e^+e^- and $\mu^+\mu^-$ pairs throughout the entire impact parameter range. This result may find application in heavy ion experimental conditions, where accepted events are triggered by zero degree calorimeter detection of neutrons from Coulomb dissociation. Detected pair production is thus more heavily weighted at small impact parameters. Predicted cross sections are then appropriately constructed from the integral of the product of the pair production probability times the dissociation probability.

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