Abstract Submitted
for the PSF17 Meeting of
The American Physical Society

Removal of Self Interactions JONATHAN UNGER[1], RAINER GROBE, Q. CHARLES SU, Illinois State University — We propose a theoretical framework that permits us to eliminate the unphysical self-repulsion that occurs if a spatially localized charged particle interacts with its own electric field. As an example of this framework, we study the time-resolved interaction between an electronic and positronic wave packet by solving the coupled set of two-particle Dirac-Maxwell equations. Here the unwanted self-repulsion can be removed by separating the total electric field into two portions, each of which is generated by only one particle and is evolved independently of the other. For example, the Maxwell equation for the electronic field has only the electronic charge density as a source term and only this field is coupled to the positron in the two-particle Dirac equation. [1-4] We acknowledge the support by the National Science Foundation. [1] S. Norris, J. Unger, Q. Z. Lv, Q. Su, and R. Grobe, Phys. Rev. A 93, 032131 (2016). [2] Q.Z. Lv, J. Unger, Y.T. Li, Q. Su and R. Grobe, Phys. Rev. A 95, 023416 (2017). [3] Q.Z. Lv, J. Unger, Y.T. Li, Q. Su and R. Grobe, Euro. Phys. Lett. 116, 40003 (2016). [4] N.D. Christensen, J. Unger, S. Pinto, Q. Su and R. Grobe, Ann. Phys. (submitted).

[1]Please schedule this talk on Saturday, thank you.

Rainer Grobe
Illinois State University

Date submitted: 30 Oct 2017 Electronic form version 1.4