SDI FINAL EVALUATION FORM 1.1

PART 1:

Journal Name:	**Physical Review & Research International**
Manuscript Number:	**2013_PRRI_6994**
Title of the Manuscript:	**Two-Body Dirac Theory**

PART 2:

FINAL EVALUATOR'S comments on revised paper (if any)	Authors' response to final evaluator's comments
The Zitterbewegung is more of a relic of the early Dirac equation days. It does not exist in the standard position, velocity and acceleration operators of the single particle field, only in alternatively derived versions like in this manuscript. Zitterbewegung is due to the "small components" of the dirac 4-spinor (the last two components in a Dirac rep. where gamma-0 is diagonal) oscillating with a frequency 2mc2, which is entirely due to the little bit of antiparticle mixed up in the particle wavefunction for a nonrelativistic motion. It doesn't appear in the correct second quantized theory, or rather, it is resolved by using Feynman propagators and doing QED. Nevertheless, it is an interesting way to understand certain QED effects heuristically. This behavior of the propagator is easy to understand in the modern chiral representation and the propagator of the field. In principle all fields are massless and propagate with c. Due to coupling however propagators can have any speed between +c and -c. The electron has two such massless components, ψ = (ψ_L,ψ_R). So, you see the ψ_L and ψ_R alternating but is there a zitterbewegung of ψ or the individual components ψ_L and ψ_R? The answer is: NO for electrons and NO for positrons. This is because these are exactly the only two solutions of the Dirac equation which do not show a zitterbewegung. The reason for this is. electron at rest: ψ_L=+ψ_R positron at rest: ψ_L=−ψ_R The other "exotic" states where ψ_L ≠ ±ψ_R at rest do show a zitterbewegung, for instance ψ_L=iψ_R or ψ_L=σzψ_R. This is actually the reason why these states are not allowed. They would radiate away electromagnetic energy with the frequency corresponding to their mass. Here are some observation of zitterbewegung. Direct observation of zitterbewegung in a Bose-Einstein condensate arXiv:1303.0914v2 [cond-mat.quant-gas] 4 Jul 2013 In this work is shown, though the oscillatory motion's large frequency and small amplitude have precluded its measurement with electrons, zitterbewegung is observable via quantum simulation. Comments: Fig. 5 contains missprint in X-axis (0.00, 0.01, 0.01,0.02,) (numbers 0.01, 0.01 are same). Also, where is the origin? The same is in Fig 6. Author has shown a new derivation of Dirac's equation as the scalar product of the electron's 4-momentum and an electromagnetic 4-potential postulated for the electron.	A point which I make in the paper is that the Dirac solutions with and without Zitterbewegung have the same positive-energy spectrum. The Dirac solution which the reviewer believes to be correct is confirmed by spectroscopc measurements, but so is the solution in which Zitterbewegung has not been suppressed by using the Dirac interpretation that positive-energy electrons are forbidden from occupying negative-energy states. So where are the experiments which would discriminate between the two solutions? They don't exist as I believe because of the metaphysical certainty of martinet theorists in the correctness of standard Dirac theory and the general intellectual fog which exists on this subject such that experimentalists are bullied into eschewing empirical studies - the stuff of every other experimental science except physics - and bullied into slavishly following a mathematical recipe not withstanding its ambiguities, divergences, and simple lack of good sense. All of this methodology and especially second quantization is just designer mathematics to get the neat and pleasing answer one wants. Figs. 5 and 6 corrected.