



SDI Review Form 1.6

Journal Name:	Physical Science International Journal
Manuscript Number:	Ms_PSIJ_37354
Title of the Manuscript:	DISCRETE PHASE SPACE, STRING-LIKE PHASE CELLS, AND RELATIVISTIC QUANTUM MECHANICS
Type of the Article	Regular (pedagogical in nature) Article

General guideline for Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound. To know the complete guideline for Peer Review process, reviewers are requested to visit this link:

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PART 1: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Compulsory REVISION comments	<p>The paper is pedagogical in nature. The author(s) is (are) trying to develop an alternative description of the quantum theory. Invariance of the equations of motion under continuous Poincare group, singularity-free Green's functions, and a singularity-free S-matrix theory are claimed as successes of this alternative theoretical formalism. Though the method involves quite a bit of mathematics, it appears to be technically ok. However, there are certain points that need to be clarified:</p> <ol style="list-style-type: none">1. What is the motivation of this kind of work, particularly when a very well established quantum theory is already there in place? From a physics point of view, the successes of this alternative formalism as claimed by the author(s) cannot be considered as a sufficient ground.2. It's clear that no new physics has come out from this kind of formulation of the quantum theory. Comment(s) on the observational consequence(s) is (are) the least that one would expect.3. A differential treatment of space and time in the so called <i>mixed representation</i>, a discrete phase space and continuous time, makes the theory incompatible to the requirement of Special Theory of Relativity. Conceptually this is difficult to digest, particularly so, as the author(s) claim(s) invariance or covariance of the equations of motion under continuous Poincare group. What is (are) the author's(s') take on this issue?4. I think the author(s) has (have) incorporated quite a large part of the quantum theory in one go. Keeping the pedagogical nature of the paper in mind, it would have been better, had the description been a little shorter in content but a little more lucid in terms of explanation, thereby making it easier to read for the students of physics in particular.5. A conclusion section containing a critical analysis of the work is needed. <p>The manuscript has to be so revised, as to address the above mentioned issues.</p>	<p>My counter-arguments for comments 1, 2, 4 : Please read references 2, 3, 4, 5, 6 cited in the bibliography.</p> <p>My comments on reviewer's comment 3 : The Abstract operator & the Hilbert space vector version of the Klein-Gordon equation is furnished in the equations (18a,b) of the manuscript. These are obviously relativistic equations by consequences of the equations (20a,b) & (27a,b) of the manuscript. Therefore, the usual Klein-Gordon equation (31) in the Schrodinger representation of quantum mechanics is relativistic. Similarly, the partial difference-differential version of the Klein-Gordon equation (32) in the discrete phase space & continuous time must be exactly relativistic.</p> <p>As regards to reviewer's comment 5 : I have added a conclusion section in the revised manuscript.</p>
Minor REVISION comments	<ol style="list-style-type: none">1. There are typos and grammatical errors in places. Some of them are already marked and rectified in the manuscript. Still there may be some more. These are to be taken care of.2. At places certain variables are introduced without being appropriately defined, e.g., see Eq.(20) and (21). The issue should be addressed.	<p>In regards to his comment 1 : I have corrected the typos now.</p> <p>-----</p> <p>TYPOGRAPHICAL CORRECTIONS OF THE OLD MANUSCRIPT</p> <p>-----</p> <ol style="list-style-type: none">1. Page 7, 1st line after fig.3: <i>pashe space</i> has been replaced by <i>phase space</i>.2. Page 10, equation (18b): $-P4 +$ has been replaced by $-(P4)^2 +$3. Page 11,1st line: <i>...ten parameter..</i> has been replaced by <i>...ten-parameter..</i>4. Page 11, 2nd line after equation (21c): <i>...transform..</i> has been replaced by <i>...transforms...</i>5. Page 12, 2nd line after equation (27b): <i>...commute...</i> has been replaced by <i>...commutes..</i>



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		<p>6. Page 14, 1st, 4th, 5th lines after equation (37d):...<i>Greens</i>... has been replaced by ...<i>Green's</i> ...</p> <p>7. Page 17,1st line after equation (47):.. <i>Hn(cdots)</i>.. has been replaced by ...<i>Hn(.....)</i>...</p> <p>8. Page 18, 3rd line after the figure-A1: .<i>the</i>.. has been replaced by . <i>The</i>...</p> <p>9. Page 12, in the first line of equation (28), from the after the right third bracket i.e. the term $[n^{\mu\nu} \dots + m^2]$, $\widehat{\overrightarrow{\psi}}$ was missing, which has been placed.</p> <p>-----</p> <p>So far his comment 2, Please consult the references (text books) 12 & 17 in the bibliography.</p>
<u>Optional/General</u> comments	None.	