SIMPLEST APPROACH TO QUANTUM GRAVITY HYPOTHESIS

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Abstract. In this short paper I will explore idea of quantazing gravity by using complex space-time and operators acting on wave vector field.
<table>
<thead>
<tr>
<th>Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Complex space-time</td>
<td>3</td>
</tr>
<tr>
<td>References</td>
<td>4</td>
</tr>
</tbody>
</table>
1. Complex space-time

Space-time in this paper is complex [1] it means that I can write a vector field of that space-time:

\[ \psi^\mu(z) = \begin{pmatrix} \psi^0(z) \\ \psi^1(z) \\ \psi^2(z) \\ \psi^3(z) \end{pmatrix} \] (1.1)

Where \( z \) is a complex coordinate that can be expressed:

\[ (z) = (x + i\chi) = (x^0 + i\chi^0, x^1 + i\chi^1, x^2 + i\chi^2, x^3 + i\chi^3) \] (1.2)

This space-time has to obey a field equation [2] [3] [4]:

\[ \partial_\mu A^\mu_\alpha(z) \eta^{\mu\kappa} \partial_\kappa \left( A^\dagger_\mu \right)_\alpha (\psi^* (z))_\alpha = \rho (x) g_{\mu\kappa} \delta^{\mu\kappa} \] (1.3)

Where \( g_{\mu\kappa} \) is metric tensor, \( \rho (x) \) is probability of finding object at point \( x \) and \( A^\mu_\alpha \) is operator acting of wave vector field. That complex space-time has an interval or space-time distance equal to:

\[ \rho (x) ds^2 (x) = g_{\mu\kappa} \delta^{\mu\kappa} d\psi^\mu (z) (d\psi^* (z))_\nu \] (1.4)

It means that it’s not one equation but for each point of space-time there is one equation, when there is measurement done it changes from probability of all possible states to just one position:

\[ \rho (x) ds^2 (x) \rightarrow ds^2 (x) \] (1.5)

Probability function needs to be normalized so:

\[ \int \rho (x) d^3x = 1 \] (1.6)
REFERENCES


