

1139-81-29

Matthias Lienert* (m.lienert@rutgers.edu), Department of Mathematics, Rutgers University, Piscataway, NJ 08904. *Direct interaction along light cones at the quantum level.*

Here we explain the idea that direct interactions along light cones (not mediated by fields) can be implemented on the quantum level using multi-time wave functions. These are wave functions $\psi(x_1, \dots, x_N)$ with N spacetime arguments $x_i = (t_i, \mathbf{x}_i)$ for N particles. Starting from the integral formulation of the non-relativistic Schrödinger equation, a covariant integral equation is derived as a novel type of evolution equation for ψ , and its mathematical structure is discussed. Moreover, we show that it correctly reduces to a Schrödinger equation with Coulomb potential if time delay effects are neglected. (Received January 09, 2018)