Unified discrete mechanics IV: The simulations of the hyperincursive discrete Majorana and Dirac quantum wave equations showing the interference and superposition of particles

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Abstract.

In the preceding papers [1, 2] on unified discrete mechanics, we have proposed to extend the formalism of the hyperincursive discrete harmonic oscillator [3] to the Klein-Gordon equation. We have deduced the hyperincursive discrete Majorana real 4-spinors quantum equations and then the hyperincursive discrete Dirac complex 4-spinors relativistic quantum equations.

This paper gives the numerical simulations of the hyperincursive discrete Majorana and Dirac quantum wave equations.

We firstly consider the simple case of the discrete quantum equations in one spatial dimension for massless particles, in a periodic spatial domain and in a box. The simulations show the interference and superposition of the particles given by integer numbers.

References

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