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Pauli principle and Clifford algebra

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The framework of classical physics is reunited with the framework of quantum mechanics, since all interactions are described with real Clifford algebras. Relativistic invariance is simply obtained from multiplications on the left place and gauge invariances are obtained from multiplications on the right place. The fundamental group of invariance of all physical interactions is the group of all invertible elements in the geometric algebra. The wave equation is gauge invariant under a gauge group which is exactly the U (1) × SU (2) × SU (3) group of the standard model of quantum physics. The mass term of the wave equation is compatible both with the form invariance that generalizes the relativistic invariance and with the gauge invariance. We integrate gravitation: If an inertial frame is heavy enough to include a quantum wave which is stationary in this frame, a double link exists between the wave equation and the Lagrangian density. Non-inertial frames are the ones coming from the use of variable terms in the geometric algebra. The normalization of the wave and the existence of a density of probability are both consequences of the principle of equivalence between inertial and gravitational mass-energy. We mainly study here the integration into this framework of the Pauli principle: we link this principle to the properties of the potential terms of gauge fields.

Biography

Claude Daviau has completed his PhD in 1993 from Nantes University and has worked with the Louis de Broglie Foundation, a private foundation created by the French Nobel Prize Louis de Broglie who discovered the quantum wave. He has published more than 25 papers in reputed journals and has been serving as an Editorial Board Member of the Annales de la Fondation Louis de Broglie.

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