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The Algebraization of Quantum Mechanics and the Implicate Order

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It has been proposed that the implicate order can be given mathematical expression in terms of an algebra and that this algebra is similar to that used in quantum theory. In this paper we bring out in a simple way those aspects of the algebraic formulation of quantum theory that are most relevant to the implicate order. By using the properties of the standard ket introduced by Dirac we describe in detail how the Heisenberg algebra can be generalized to produce an algebraic structure in which it is possible to describe space translations in a way that is analogous to the description of rotations in a Clifford algebra. This approach opens up the possibility of going beyond the limits of the present quantum formalism and we discuss briefly some of the new implications.

1. INTRODUCTION

In a previous paper[1] we discussed how Bohm's proposals[2] concerning the introduction of a new conceptual approach to physics based on the notion of the implicate order could give a new insight into the meaning of physical phenomena in general and to the spinor in particular. In terms of the implicate order, movement or process is taken as basic and the primitive forms of the usual approach, such as particle, field, spacetime, etc., are to be regarded as but abstractions from this basic underlying activity.

One of the key features of the implicate order is that the basic process should be regarded as forming an undivided whole in which any particle or more complex system appears as a semiautonomous, quasistable structured movement within the whole process. In this way a particle and its behavior will take its meaning only in the context of the total process. It is this feature that was constantly emphasized by Bohr[3] and receives support from the nonlocal or nonseparable aspects that are implied by quantum mechanics.[4,5]

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