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Dirac's Quantum Time

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In 1926, Dirac had attempted to give a relativistic generalization of his mechanics of q-numbers, defining a new “quantum time” starting from the relation (P. A. M. Dirac, Relativistic quantum mechanics, Proc. Roy. Soc. of London A111 (1926) pp. 405-423.):

$$tW - Wt = -i\hbar$$

In the 1927 article, Heisenberg will start from this relationship by Pauli and Dirac which implies this new concept of quantum (relativistic) time.

all the historical formulations of quantum mechanics were time irreversible. Time was a matrix in Heisenberg matrix mechanics and all the physical variables obeyed a matrix evolution, time irreversible equation. Schrödinger equation was written as representing the propagation of an irreversible physical wave.

One has been able to state that quantum mechanics is time reversible only by defining the time reversal operator in a new way, involving also complex conjugation, just to obtain reversibility. This new formal insight was obtained for the first time only in 1932, in the paper Über die Operation Zeitumkehr der in der Quantenmechanik by Eugene Wigner.

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