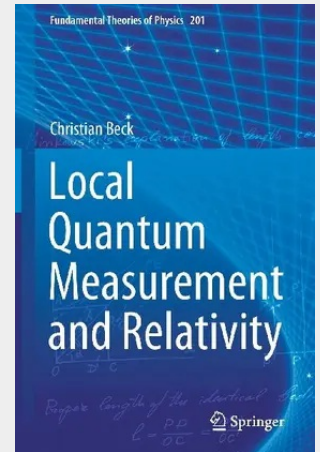


Local Quantum Measurement and Relativity

This book treats various aspects of the quantum theory of measurement, partially in a relativistic framework. Measurement(-like) processes in quantum theory are identified and analysed; and the quantum operator formalism is derived in full generality without postulating operators as observables. Consistency conditions are derived, expressing the requirement of Lorentz-frame independence of outcomes of spacelike separated measurements and implying the impossibility of using quantum nonlocality to send signals faster than light. Local commutativity is scrutinized. The localization problem of relativistic quantum theory is studied, including comprehensive derivation of the theorems of Hegerfeldt, Malament and Reeh-Schlieder. Finally, the quantum formalism is derived from the dynamics of particles with definite positions in Bohmian mechanics.

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