Frank Hättich, *Whitehead's Process Philosophy and Quantum Field Theory*.
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Abstract

In this dissertation it is investigated in detail whether and to what extend the process philosophy developed by A. N. Whitehead, can provide an adequate ontology of the currently best physical theory for the description of subatomic phenomena—Quantum Field Theory (QFT).
In the first part of this work a new interpretation of Whitehead's writings on his "philosophy of process" is developed. This interpretation includes some results not to be found in any already existing Whitehead-interpretation. Most importantly, it is argued that for reasons of consistency, Whitehead's notion of process needs to be generalized to encompass also non-separable processes.
The second part of the work is devoted to the exposition of the algebraic formalism of QFT, its usual physical interpretation and to the role it plays in comparison to other formalisms of QFT.
In the third part of this dissertation it is investigated how the structures of the modified version of Whitehead's ontology developed in part one, can be represented by mathematical objects and structures available within the algebraic formalism of QFT. It is shown that many of the structures of Whitehead's ontology can indeed be seen as an adequate ontological underpinning for QFT; but there are also some divergences between Whiteheadian ideas and what QFT seems to tell us. In particular, the Whiteheadian assumption that the world is an evolving process of the actualization of concrete occasions, is hard to reconcile with the special relativistic spacetime structure as incorporated in QFT.
An important ontological results of this work, that will be of interest independently from the Whiteheadian framework chosen here, is that QFT seems to undermine the view of properties as universals.