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Particles, cutoffs and inequivalent representations. Fraser and Wallace on quantum field theory. (English) Zbl 1385.81029

Summary: We critically review the recent debate between Doreen Fraser and David Wallace on the interpretation of quantum field theory, with the aim of identifying where the core of the disagreement lies. We show that, despite appearances, their conflict does not concern the existence of particles or the occurrence of unitarily inequivalent representations. Instead, the dispute ultimately turns on the very definition of what a quantum field theory is. We further illustrate the fundamental differences between the two approaches by comparing them both to the Bohmian program in quantum field theory.

MSC:
81T05 Axiomatic quantum field theory; operator algebras
46L60 Applications of selfadjoint operator algebras to physics
81V25 Other elementary particle theory in quantum theory

Keywords:
algebraic quantum field theory; particle physics; renormalization; unitarily inequivalent representations

Full Text: DOI

References:
[26] Daumer, M; Dürr, D; Goldstein, S; Zanghí, N, Naive realism about operators, Erkenntnis, 45, 379, (1997) · Zbl 0912.47044

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