

AN UPDATE ON STRING-LOCAL QUANTUM FIELDS

by

José Gracia Bondía

Gauge field theory has been the dominant paradigm in quantum field theory and particle physics for a long while now. However, no line of business is forever secure from disruption. String-local fields, introduced as free fields 13 years ago by Mund, Schroer and Yngvason, constitute a promising new technology.

There one trades off gauge invariance for a weaker locality and the principle of string independence. In exchange one obtains:

1. Always positive definite metric (ghosts and other unphysical fields are not called for).
2. Better ultraviolet behavior than for point-local fields, irrespective of spin.
3. Wigner's unbounded-helicity particles enter the realm of physics.
4. Issues like the Weinberg—Witten no-go theorem and the Dam—Veltman discontinuity are revisited and resolved.
5. Light is shed on dark corners of the SM.