

FREE FIELDS QUANTIZATION IN THE “KREIN” SPACE

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S u m m a r y

It has been shown that the presence of negative-norm states or negative-energy solutions (unphysical states) is indispensable for a fully covariant quantization (Krein space quantization) of the minimally coupled free scalar field in the de Sitter spacetime [?, ?]. This method of quantization is extended here to free fields in the Minkowski spacetime. Contrary to the scalar field [?], some unphysical (negative-energy) states of spinor and vector fields have positive norms. This departure from the usual Krein space led to the defined “Krein” space. The presence of unphysical negative-frequency states plays the role of an automatic renormalization tool for the free quantum field theory (QFT).