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Probing QFT bedrock principles and the inverse problem @ future lepton colliders

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We consider the positivity bounds on dimension-8 four-electron operators and study two related phenomenological aspects at future lepton colliders. First, if positivity is violated, probing such violations will revolutionize our understanding of the fundamental pillars of quantum field theory and the S-matrix theory. Second, the positive nature of the dimension-8 parameter space allows us to either directly infer the existence of UV-scale particles together with their quantum numbers or exclude them in a model-independent way. We demonstrate with realistic examples how those possibilities can be achieved.

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