

Abstract Submitted
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Pair creation rates for one-dimensional fermionic and bosonic vacua¹ MATTHEW WARE, Q. SU, R. GROBE, Illinois State University — We compare the creation rates for particle-antiparticle pairs produced by a supercritical force field for fermionic and bosonic model systems. The rates obtained from the Dirac and Klein-Gordon equations can be computed directly from the quantum mechanical transmission coefficients describing the scattering of an incoming particle with the supercritical potential barrier. We provide a unified framework that shows that the bosonic rates can exceed the fermionic ones, as one could expect from the Pauli exclusion principle for the fermion system. The predicted pair-creation rates also match the slopes of the time-dependent particle probabilities obtained from large-scale ab initio numerical simulations based on quantum field theory.

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