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## Pair production in strong inhomogeneous electric fields

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We investigate the electron-positron pair production in electric fields with spatio-temporal inhomogeneity using a Hamiltonian method based on light-front quantization. We truncate the Fock space up to the sector containing 4 pairs of electrons and positrons, by which we can track each particle fully quantum-mechanically. We calculate observables such as the invariant mass and the longitudinal momentum distribution of the produced pairs as a function of evolution time. We observe a critical intensity of background field, above which the pair production rate is no longer oscillating with time periodically as in perturbation theory. This work may provide the foundation for the study of the pair production process in strong fields with realistic space-time structures.

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