On the Gauge Invariance of the Transition Probability of a Charged Particle in Electromagnetic Field

QIAN Shang-Wu[1] and GU Zhi-Yu[2]

[1] Physics Department, Peking University, Beijing 100871, China
[2] Physics Department, Capital Normal University, Beijing 100037, China

Abstract: This paper suggests a principle to find a unitary operator U which transforms non-physical quantity, zero-potential Hamiltonian H_0, into true physical quantity $UH_0U^\dagger$ for a charged particle in classical electromagnetic field, and puts forward a unified form of constructing gauge-independent transition probabilities in this case. Different methods correspond to different unitary operators which satisfy the above-mentioned principle.

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