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Wataru Ichinose* (ichinose@math.shinshu-u.ac.jp), Asahi 3-1-1, Matsumoto, Nagano. *On the Feynman path integral with spin for non-relativistic quantum electrodynamics.*

The Feynman path integral for non-relativistic QED with spin can be defined rigorously via the non-perturbative method as in Feynman and Hibbs's book in 1965. We begin with the Lagrangian function representing the motion of classical charged particles and the Maxwell equations. We suppose that the quantum particles have spin. Then, the Feynman path integral with spin can be constructed in terms of piecewise straight lines, i.e. the motion of free particles and photons. It is also proved that the Feynman path integral satisfies the equation derived from operational method. We note there that the Coulomb potential appears between charged particles.

References.(1) On the Feynman path integral for nonrelativistic quantum electrodynamics, Rev. Math. Phys. 2010.
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(3) On the semi-classical approximation of the solution of the Heisenberg equation with spin, Ann. Inst. Henri Poincaré, Phys. Théor. 1997. (Received July 11, 2012)