

場の量子論 p204check7.8

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$$\{i\gamma^\mu [\partial_\mu + igA'_\mu(x)] - m\} \Psi'(x) \quad (1)$$

$$= \{i\gamma^\mu [\partial_\mu + ig\{U(x)A_\mu(x)U^{-1}(x) + \frac{i}{g}[\partial_\mu U(x)]U^{-1}(x)\}] - m\} U(x)\Psi(x) \quad (2)$$

$$= \{i\gamma^\mu [\partial_\mu + igU(x)A_\mu(x)U^{-1}(x) - \{\partial_\mu U(x)\}U^{-1}(x)] - m\} U(x)\Psi(x) \quad (3)$$

$$= \{i\gamma^\mu [U(x)\partial_\mu + \{\partial_\mu U(x)\} + igU(x)A_\mu(x) - \{\partial_\mu U(x)\}] - U(x)m\} \Psi(x) \quad (4)$$

$$= U(x)\{i\gamma^\mu [\partial_\mu + igA_\mu(x)] - m\} \Psi(x) \quad (5)$$

$$= U(x)0 \quad (6)$$

$$= 0 \quad (7)$$

参考文献

- [1] 坂本眞人著「場の量子論-不変性と自由場を中心にして」(裳華房,2014,ISBN9784785325114)