

場の量子論 p205check7.9

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$$D'_\mu \Psi'(x) = [\partial_\mu + igA'_\mu(x)]\Psi'(x) \quad (1)$$

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

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

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

$$= U(x)[\partial_\mu + igA_\mu(x)]\Psi(x) \quad (5)$$

$$= U(x)D_\mu \Psi(x) \quad (6)$$

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)