場の量子論 p92check4.4

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1　ディラック方程式

1.1　$d = 3$

$$\{\gamma^0, \gamma^0\} = \{\sigma^3, \sigma^3\} = \sigma^3\sigma^3 + \sigma^3\sigma^3 = I_2 + I_2 = 2I_2 \tag{1}$$
$$\{\gamma^0, \gamma^1\} = \{\sigma^3, i\sigma^1\} = i\sigma^3\sigma^1 + i\sigma^1\sigma^3 = -\sigma_2 + \sigma_2 = 0 \tag{2}$$
$$\{\gamma^0, \gamma^2\} = \{\sigma^3, i\sigma^2\} = i\sigma^3\sigma^2 + i\sigma^2\sigma^3 = \sigma_1 - \sigma_1 = 0 \tag{3}$$
$$\{\gamma^1, \gamma^1\} = \{i\sigma^1, i\sigma^1\} = -\sigma^1\sigma^1 - \sigma^1\sigma^1 = -I_2 - I_2 = -2I_2 \tag{4}$$
$$\{\gamma^1, \gamma^2\} = \{i\sigma^1, i\sigma^2\} = -\sigma^1\sigma^2 - \sigma^2\sigma^1 = -\sigma_3 + \sigma_3 = 0 \tag{5}$$
$$\{\gamma^2, \gamma^2\} = \{i\sigma^2, i\sigma^2\} = -\sigma^2\sigma^2 - \sigma^2\sigma^2 = -I_2 - I_2 = -2I_2 \tag{6}$$

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)