## 3-3

已知 
$$\gamma_5 \equiv \gamma_1 \gamma_2 \gamma_3 \gamma_4$$
,证明: $\gamma_5 = \frac{1}{4!} \varepsilon_{\mu\nu\alpha\beta} \gamma_\mu \gamma_\nu \gamma_\alpha \gamma_\beta$ 

$$\gamma_5 \equiv \gamma_1 \gamma_2 \gamma_3 \gamma_4$$

上式两边同乘  $\varepsilon_{\mu\nu\lambda\rho}$ :

$$egin{aligned} arepsilon_{\mu
u\lambda
ho}\gamma_5 &= arepsilon_{\mu
u\lambda
ho}\gamma_1\gamma_2\gamma_3\gamma_4 \ &= \gamma_\mu\gamma_
u\gamma_\lambda\gamma_
ho \end{aligned}$$

上式继续两边同乘  $\varepsilon_{\mu\nu\lambda\rho}$ :

$$arepsilon_{\mu
u\lambda
ho}arepsilon_{\mu
u\lambda
ho}\gamma_5=arepsilon_{\mu
u\lambda
ho}\gamma_\mu\gamma_
u\gamma_\lambda\gamma_
ho$$

利用  $\varepsilon_{\mu\nu\lambda\rho}\varepsilon_{\mu\nu\lambda\rho}=4!$ :

$$4!\gamma_5=arepsilon_{\mu
u\lambda
ho}\gamma_\mu\gamma_
u\gamma_\lambda\gamma_
ho$$

即:

$$\gamma_5 = rac{1}{4!} arepsilon_{\mu
u\lambda
ho} \gamma_\mu \gamma_
u \gamma_\lambda \gamma_
ho$$