## 3-5

证明任何共轭旋量  $ar{f}=f^\dagger(p)\gamma_4$  可用  $ar{u}_i$  和  $ar{v}_i$  展开

$$ar{f}(p) = a_i'ar{u}_i(ec{p}) + b_i'ar{v}_i(ec{p})$$

其中

$$a_i' = rac{E}{m} ar{f}(p) u_i(ec{p})$$

$$b_i' = -rac{E}{m}ar{f}(p)v_i(ec{p})$$

证明:

设 $\bar{f}(p)$ 可展为:

$$ar{f}(p) = a_i'ar{u}_i(ec{p}) + b_i'ar{v}_i(ec{p})$$

由

$$u_iar{u}_i-v_iar{v}_i=rac{m}{E}I$$

对  $ar{f}(p)$ 

$$ar{f}(p) = ar{f}(p)I = rac{E}{m}ar{f}(p)u_iar{u}_i - rac{E}{m}ar{f}(p)v_iar{v}_i$$

对比可得:

$$a_i' = rac{E}{m}ar{f}(p)u_i, \quad b_i' = -rac{E}{m}ar{f}(p)v_i$$