Simmetria/Antisimmetria di singoletti e tripletti in *SU(2)*

Si considera valido un principio di Pauli generalizzato, dove particelle e antiparticelle sono considerate fermioni identici : per quanto apparentemente bizzarro, questo e' in realta' coerente con l'idea di ricercare le proprieta' di simmetria/antisimmetria degli stati come caratteristiche del gruppo, e non delle particelle

Particelle e antiparticelle stanno nella stessa rappresentazione

$$\mathbf{2} : \alpha = p, \quad \beta = n$$
$$\overline{\mathbf{2}} : \alpha = \overline{n}, \quad \beta = -\overline{p}$$

$$\mathbf{2} \otimes \mathbf{2} = \mathbf{1} \oplus \mathbf{3}$$

Triplet

$$\underset{\alpha(1)\alpha(2)}{(uu)} \rightarrow \underset{\alpha(1)\alpha(2)}{(uu)} \qquad S$$

$$\underset{\beta(1)\beta(2)}{(dd)} \rightarrow \underset{\beta(1)\beta(2)}{(dd)} \qquad S$$

$$\frac{1}{\sqrt{2}} \underset{\alpha(1)\beta(2)+\beta(1)\alpha(2)}{(ud + du)} \rightarrow \frac{1}{\sqrt{2}} \underset{\beta(1)\alpha(2)+\alpha(1)\beta(2)}{(du + ud)} \qquad S$$

Singlet

$$\frac{1}{\sqrt{2}} \underset{\alpha(1)\beta(2)-\beta(1)\alpha(2)}{(ud - du)} \rightarrow \frac{1}{\sqrt{2}} \underset{\beta(1)\alpha(2)-\alpha(1)\beta(2)}{(du - ud)} \qquad A$$

$$\mathbf{2} \otimes \overline{\mathbf{2}} = \mathbf{1} \oplus \mathbf{3}$$

Triplet

$$\underset{\alpha(1)\alpha(2)}{(u\overline{d})} \rightarrow \underset{\alpha(1)\alpha(2)}{(\overline{d}u)} \qquad S$$

$$\underset{\beta(1)\beta(2)}{((-\overline{u})d)} \rightarrow \underset{\beta(1)\beta(2)}{(d(-\overline{u}))} \qquad S$$

$$\frac{1}{\sqrt{2}} \underset{\alpha(1)\beta(2)+\beta(1)\alpha(2)}{\left(u(-\overline{u}) + d\overline{d}\right)} \rightarrow \frac{1}{\sqrt{2}} \underset{\beta(1)\alpha(2)+\alpha(1)\beta(2)}{\left((-\overline{u})u + \overline{d}d\right)} \qquad S$$

Singlet

$$\frac{1}{\sqrt{2}} \underset{-\alpha(1)\beta(2)+\beta(1)\alpha(2)}{\left(-u(-\overline{u}) + d\overline{d}\right)} \rightarrow \frac{1}{\sqrt{2}} \underset{-\beta(1)\alpha(2)+\alpha(1)\beta(2)}{\left(-(-\overline{u})u + \overline{d}d\right)} \qquad A$$