Probabilita’ di trovare elicita’ positiva/negativa in uno stato a chiralita’ positiva/negativa:

uso degli spinori di Dirac

$$P_+^{(R)} = \frac{\left(\frac{E+m+p}{E+m}\right)^2}{\left(\frac{E+m+p}{E+m}\right)^2+\left(\frac{E+m-p}{E+m}\right)^2} = \frac{\left(E+m+p\right)^2}{\left(E+m+p\right)^2+\left(E+m-p\right)^2}$$

$$\frac{\left(1+\frac{1}{\gamma}+\beta\right)^2}{\left(1+\frac{1}{\gamma}+\beta\right)^2+\left(1+\frac{1}{\gamma}-\beta\right)^2} = \frac{\left(1+\sqrt{1-\beta^2}+\beta\right)^2}{\left(1+\sqrt{1-\beta^2}+\beta\right)^2+\left(1+\sqrt{1-\beta^2}-\beta\right)^2}$$

$$= \frac{\left(\left(\sqrt{1+\beta}\right)^2+\sqrt{1-\beta^2}\right)^2}{\left(\left(\sqrt{1+\beta}\right)^2+\sqrt{1-\beta^2}\right)^2+\left(\left(\sqrt{1-\beta}\right)^2+\sqrt{1-\beta^2}\right)^2}$$

$$= \frac{(1+\beta)\cancel{\left(\left(\sqrt{1+\beta}\right)+\sqrt{1-\beta}\right)^2}}{(1+\beta)\cancel{\left(\left(\sqrt{1+\beta}\right)+\sqrt{1-\beta}\right)^2}+(1-\beta)\cancel{\left(\left(\sqrt{1-\beta}\right)+\sqrt{1+\beta}\right)^2}} = \frac{1+\beta}{2} = P_-^{(L)}$$

$$P_+^{(L)} = P_-^{(R)} = \frac{1-\beta}{2}$$