Griffiths 7.9.

$\psi_c = i\gamma^2\psi^*$

$$i\gamma^2 = i\begin{pmatrix} & & & -i \\ & & i & \\ & i & & \\ -i & & & \end{pmatrix}$$

$$= \begin{pmatrix} & & & 1 \\ & & -1 & \\ & -1 & & \\ 1 & & & \end{pmatrix}.$$

$$i\gamma^2 u^{(1)*} = u_c^{(1)} = N^*\begin{pmatrix} 1 \\ 0 \\ -\frac{cP_z}{E+mc^2} \\ \frac{c(P_x-iP_y)}{E+mc^2} \end{pmatrix} \text{ in reverse order}, = N^*\begin{pmatrix} \frac{c(P_x-iP_y)}{E+mc^2} \\ \frac{-cP_z}{E+mc^2} \\ 0 \\ 1 \end{pmatrix} = v^{(1)}.$$

$$i\gamma^2 u^{(2)*} = u_c^{(2)} = N^*\begin{pmatrix} 0 \\ -1 \\ -\frac{c(P_x+iP_y)}{E+mc^2} \\ \frac{c(-P_z)}{E+mc^2} \end{pmatrix} \text{ in reverse order} = N^*\begin{pmatrix} \frac{c(-P_z)}{E+mc^2} \\ -\frac{c(P_x+iP_y)}{E+mc^2} \\ -1 \\ 0 \end{pmatrix} = v^{(2)}.$$

$\Rightarrow u_c^{(1)} = v^{(1)}, \quad u_c^{(2)} = v^{(2)}$