$$\Delta x = x_2 - x_1$$

$$\Delta y = y_2 - y_1$$

$$\Delta z = z_2 - z_1$$

$$C\begin{pmatrix} A_1' \\ A_2' \\ A_3' \\ A_4' \end{pmatrix} = \begin{pmatrix} \\ \\ \\ \\ \end{pmatrix}\begin{pmatrix} A_1 \\ A_2 \\ A_3 \\ A_4 \end{pmatrix} C$$

$$\frac{\Delta x}{\Delta \tau}$$

$$\frac{\Delta y}{\Delta \tau}$$

$$\frac{\Delta z}{\Delta \tau}$$

$$\text{``}\ \frac{\Delta t}{\Delta \tau}$$

$$u_x = \frac{\Delta x}{\Delta t}$$

$$A_1 = \frac{\Delta x}{\Delta \tau} = \frac{\Delta x}{\Delta t} \cdot \frac{\Delta t}{\Delta \tau}$$

$$= u_x \frac{\Delta t}{\Delta \tau}$$

$$\Delta\tau = \Delta t\sqrt{1-\frac{u^2}{c^2}}$$

$$\gamma_u \equiv \frac{1}{\sqrt{1-\frac{u^2}{c^2}}}$$

$$\Delta\tau = \frac{\Delta t}{\gamma_u}$$

$$\gamma = \frac{1}{\sqrt{1-\frac{v^2}{c^2}}}$$

$$\gamma_u = \frac{1}{\sqrt{1-\frac{u^2}{c^2}}}$$

$$\gamma_{u'} = \frac{1}{\sqrt{1-\frac{u'^2}{c^2}}}$$

$$\gamma_{u'} u_x' = \gamma \gamma_u u_x + i\beta\gamma \gamma_u ic$$

$$\gamma_{u'} u_y' = \gamma_u u_y$$

$$\gamma_{u'} u_z' = \gamma_u u_z$$

$$\gamma_{u'} ic = -i\beta\gamma \gamma_u u_x + \gamma\gamma_u ic$$

$$\gamma_{u'} = \gamma \gamma_u \left[1 - \frac{v u_x}{c^2} \right]$$