



WRT Earth:

$X_1 = \text{Coord of Orion} = -2.5 \text{ E3 Cy}$

$X_2 = \text{Lyre} = 2.5 \text{ E3 Cy}$

$\Delta X = \text{distance from } X_1 \text{ to } X_2 = 5 \text{ E3 Cy}$

$t_1 = t_2 = 0 \Rightarrow \text{proper time length}$

$$\gamma = 1$$

WRT  $\text{Lyre}$

$$X'_1 = \gamma (X_1 - vt_1) = X_1 \quad \text{①}$$

$$X'_2 = X_2 \quad \text{②}$$

$\Delta X = 5 \text{ E3}$

$$\Delta t' = \gamma \left( \Delta t - \frac{v \Delta x}{c^2} \right) \Rightarrow \Delta t' = - \frac{v \Delta x}{c^2} = \underline{\underline{-4.61 \text{ E-3 sec}}}$$

a) the time difference between the two events is

$$\underline{\underline{-4.61 \text{ E-3 seconds.}}}$$

abs.

b) to know which one happened first we evaluate ① ②

~~$X'_1$~~  or we can simply see that since

$$\Delta x' = \text{---ve} \Rightarrow \Delta x' = X'_2 - X'_1$$

$\Rightarrow X'_1 > X'_2$  and that made  $\Delta x$  negative

so  $X'_2$  happened first since it's "less"

$X'_2 \Rightarrow \text{Lyre: the nova of Lyre came first.}$