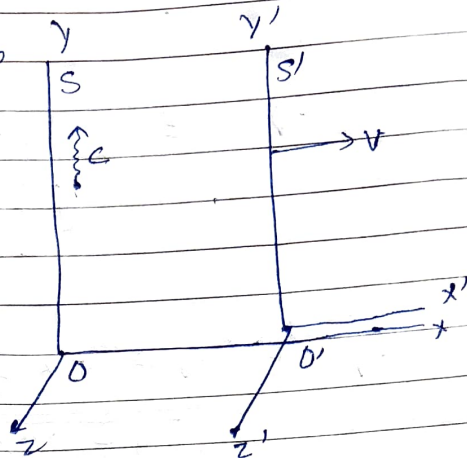


TRANSVERSE DOPPLER EFFECT

No length contraction effects due to transverse direction

Time dilation



According to time dilation

$$T = \frac{T_0}{\sqrt{1 - v^2/c^2}}$$

where T = Time period of light in S frame

$$T = \frac{1}{\nu} \quad \nu = \text{frequency of light in S frame}$$

T_0 = Time period of light in S' frame

$$T = \frac{1}{\nu'}$$

ν' = frequency of light in S' frame

$$\frac{1}{\nu} = \frac{1}{\nu'} \sqrt{1 - v^2/c^2}$$

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

$$v' = \frac{v}{\sqrt{1 - v^2/c^2}} \Rightarrow v' > v$$

conclusion \rightarrow

v' is higher than v



Blue shift

