Found two ways to measure star's temperature

\[ T = \frac{\lambda_{\text{max}}}{A} \]

\[ \text{Radius} \rightarrow \text{Using absorption lines} \rightarrow 0 - M \]

Chemical Composition: Brightness

\[ F_{\text{surface}} = a T^4 \frac{L}{m^2} \]

\[ L = 4\pi R^2 F \]

\[ F_{\text{Earth}} = \frac{L}{4\pi D^2} \]

What is Star's mass?

Mass \rightarrow Binary

\[ m_1 \cdot V_1^2 = G \frac{m_1 m_2}{r^2} \]

\[ V_1 = \sqrt{\frac{m_2}{m_1}} \]

\[ \frac{r_1}{r_2} = \frac{m_2}{m_1} \]

\[ \Delta x = V_{\text{amb}} \cdot T \]

\[ T = \frac{l}{2\pi ft} \]

\[ d_{\text{app}} = V_{\text{sound}} \cdot T + V_{\text{amb}} \cdot T = d_0 \left( 1 + \frac{V_{\text{amb}}}{V_{\text{sound}}} \right) \]

\[ d_{\text{max}} = 2.9 \text{ mm} \]
For light: Need Einstein’s special Theory of Relativity since there is no medium “at rest” relative to which light moves with speed $c$ - it moves with speed $c$ relative to ALL inertial coordinate systems! =>

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

\[ \tan \alpha = \frac{v}{c} \]

\[ c \tau \leq \tau \]

Time dilation

No two events are simultaneous in all frames of reference.