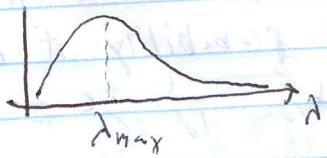
01-28-15

Found two ways to measure star's temperature

$T \leftrightarrow \lambda_{max} = \frac{2.9\text{ mm}}{T/K}$



Using absorption lines => O - M

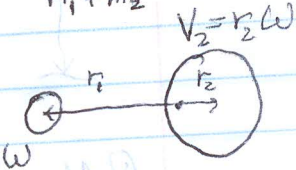
Radius ↔ Chemical Composition

$F_{surface} = \sigma T^4 \frac{W}{m^2}$, $L = 4\pi R^2 \cdot F$,

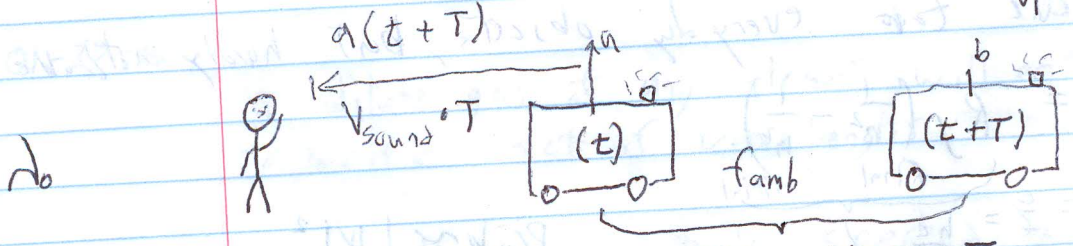
Brightness $F_{Earth} = \frac{L}{4\pi D^2}$

what is star's mass?

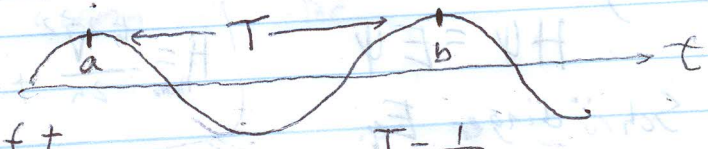
Mass → Binary → $\frac{m V^2}{r} = G\frac{mM}{r^2}$ = Total mass $m_1 + m_2$



$\frac{r_1}{r_2} = \frac{m_2}{m_1}$



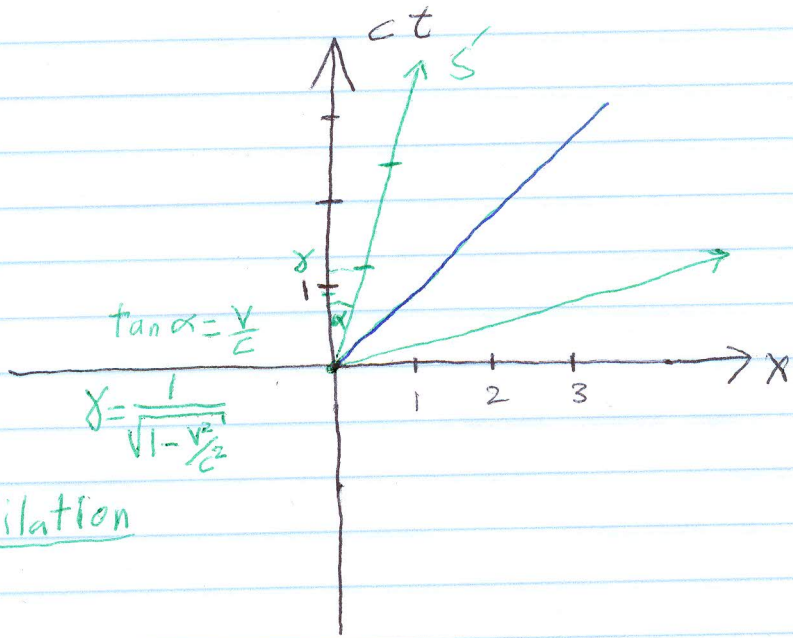
$\lambda_0 = \frac{V_{sound}}{f_{amb}} = V_{sound} \cdot T$



$\sin 2\pi f t$ $\quad T = \frac{1}{f}$

$\lambda_{app} = V_{sound} \cdot T + V_{amb} \cdot T = \lambda_0 \left(1 + \frac{V_{amb}}{V_{sound}}\right)$

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! =>



Time dilation

No two events are simultaneous in all frames of reference