

v_{ws0}

$$f = \frac{v_{ws0}}{L}$$

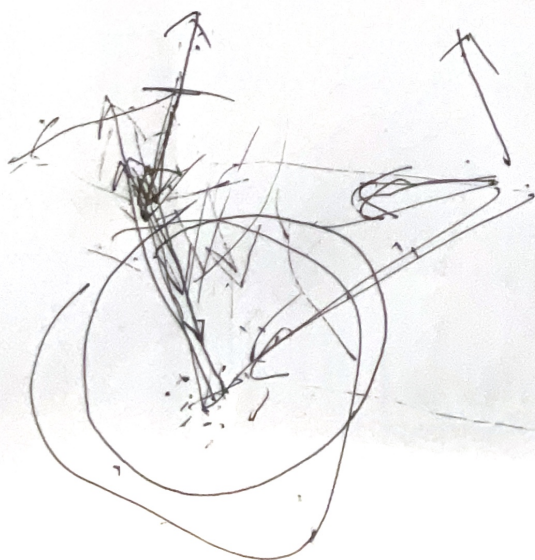
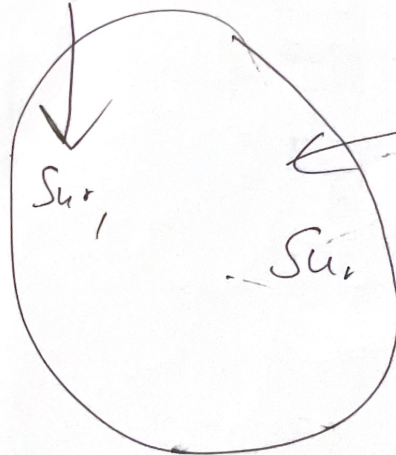
$$= \frac{df}{f} \times \frac{f}{v_{ws0}}$$

f_c

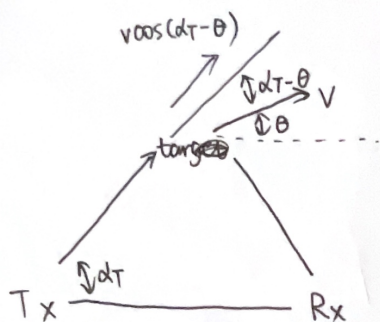
f_c

$P_{X,r}$

$\frac{v_{ws0}}{L} P_r$

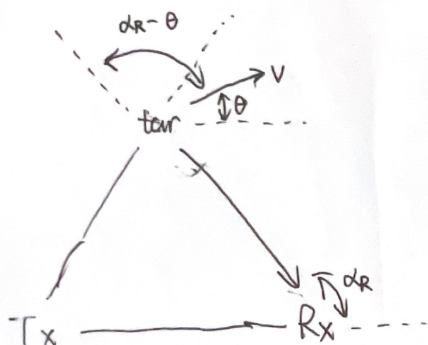


$$DFS = \cancel{f_{tx}} f_{tx} - f_{rx}$$



$$\begin{aligned} \frac{c}{f_{tx}} &= \frac{c - v \cos(\alpha_T - \theta)}{f_{tar}} \\ &= \frac{-v \cos(\alpha_T - \theta)}{\cancel{f_{tx}} - f_{tar}} = \frac{-v \cos(\alpha_T - \theta)}{\Delta f_{p1}} \end{aligned}$$

$$\Delta f_{p1} = -\cancel{f_{tx}} f_{tx} \frac{v \cos(\alpha_T - \theta)}{c}$$



$$\begin{aligned} \frac{c}{f_{rx}} &= \frac{c - v \cos(\alpha_R - \theta)}{\cancel{f_{tar}}} = \\ &= \frac{-v \cos(\alpha_R - \theta)}{f_{tar} - f_{tx}} = \frac{-v \cos(\alpha_R - \theta)}{\Delta f_{p2}} \end{aligned}$$

$$\Delta f_{p2} = -f_{tx} \frac{v \cos(\alpha_R - \theta)}{c}$$

$$f_D = \Delta f_{p1} + \Delta f_{p2} = -\frac{f_{tx} v}{c} (\cos(\alpha_T - \theta) + \cos(\alpha_R - \theta))$$

$$= -\frac{2 f_{tx} v}{c} \cos\left(\frac{\alpha_T + \alpha_R}{2} - \theta\right) \cos\left(\frac{\alpha_T - \alpha_R}{2}\right)$$

$$\begin{aligned} & \cancel{v \cos(\alpha_T - \theta)} \\ & \oplus \cancel{v \cos(\alpha_R - \theta)} \\ & \Delta f_D = \cancel{f_{tar}} - \cancel{f_{tx}} \end{aligned}$$

$$c - v \cos(\alpha_R - \theta)$$