

Module 8 - Lateral Acceleration Gain

$$L.A. = \frac{a_y}{\delta} = \frac{\frac{u^2}{gR}}{\frac{L}{R} + K \frac{u^2}{gR}}$$

$$L.A. = \frac{\frac{u^2}{gL}}{1 + \frac{Ku^2}{gL}}$$

- when $K=0 \Rightarrow$ Gain $\propto u^2$
- when $K < 0$ (oversteer), the denominator decreases as speed increases. when the denominator = 0 \Rightarrow Gain = ∞ i.e. critical speed
- when $K > 0$ (understeer), the denominator increases as speed increases.

At high speed $\frac{K u^2}{g L} \gg 1$

$$L.A. \approx \frac{u^2/gL}{\frac{K u^2}{g L}} = \frac{1}{K}$$

- when $\frac{u^2}{g R / \delta} = \frac{1}{2K}$, this is the characteristic speed.

