

1 p_{max}

$$t_e = \frac{p + r(p^2 + q^2)/v}{\omega} \quad (1)$$

$$\dot{\omega} = 0 \quad (2)$$

$$0 = -D\omega - t_e + u_{max} \quad (3)$$

$$\frac{p + rp^2}{v} = -D\omega^2 + u_{max}\omega - rq^2/v \quad (4)$$

$$\text{Assume: } p \leq 1 \quad (5)$$

$$p_{max} = \frac{v}{1+r} (-D\omega^2 + u_{max}\omega - rq^2/v) \quad (6)$$