**SLEW RATE LIMITING**

**WHAT IT IS:**

- Maximum $\frac{dV}{dt}$ possible at op-amp output
- "SPEED LIMIT"

**ANALYSIS PROCEDURE**

1) Determine output $V_{out}(t)$ from linear behavior (transfer function, 1st order step response)

2) Calculate $\frac{dV_{out}(t)}{dt}$

3) See if max $\frac{dV_{out}(t)}{dt}$ exceeds slew rate limit

**EXAMPLE: LM741**

- LM741 SLEW RATE LIMIT
- $0.5 \frac{V}{\text{MSec}}$

**SINUSOID**

- Predicted by transfer function
- $V_{out}(t) = V_{PK} \sin(2\pi ft)$
- $\frac{dV_{out}(t)}{dt} = 2\pi f V_{PK} \cos(2\pi ft)$

**STEP**

- Predicted by 1st order step
- $V_{out}(t) = V_f - (V_f - V_i) e^{-t/\tau}$
- $\frac{dV_{out}(t)}{dt} = \frac{(V_f - V_i)}{\tau} e^{-t/\tau}$

Max $\frac{dV}{dt}$ is 1 at $t=0$