Sensitivity to Parameter Variations

From before:

$$\delta T_{\text{cl}} = \frac{K_{\text{cl}}}{(1 + AK_{\text{cl}})^2} \delta A$$

$$T_{\text{cl}} = \frac{AK_{\text{cl}}}{1 + AK_{\text{cl}}}$$

Therefore

$$\delta T_{\text{cl}}/T_{\text{cl}} = \frac{\frac{K_{\text{cl}}}{(1+AK_{\text{cl}})^2}\delta A}{\frac{AK_{\text{cl}}}{1+AK_{\text{cl}}}} = \frac{1}{1 + AK_{\text{cl}}}\delta A/A$$

Sensitivity: $\mathcal{S}_{\text{cl}} = \dfrac{\delta T_{\text{cl}}/T_{\text{cl}}}{\delta A/A} = \dfrac{1}{1 + AK_{\text{cl}}}$ ($\ll 1$ for large K_{cl})

With high-gain feedback, we get smaller relative error due to parameter variations in the plant model.