



Figure 1: Error Dynamics of the Overshoot Case

## 0.1 Overshoot

A P controller is used for introducing overshoots and oscillations. This P controller solves the pick and place problem but cannot fully eliminate steady state errors as shown in Figure 1.

$$K_p = \begin{bmatrix} 30.0 & 0.0 & 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 20.0 & 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 30.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 200.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 & 200.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 & 0.0 & 30.0 \end{bmatrix}$$