Lead Compensation: Bode Plot

$$KD(s) = K\frac{s+z}{s+p}, \qquad p \gg z$$

In Bode form:

$$KD(s) = \frac{Kz\left(\frac{s}{z}+1\right)}{p\left(\frac{s}{p}+1\right)}$$

or, absorbing z/p into the overall gain, we have

$$KD(s) = \frac{K\left(\frac{s}{z}+1\right)}{\left(\frac{s}{p}+1\right)}$$

Break-points:

- Type 1 zero with break-point at $\omega = z$ (comes first, $z \ll p$)
- Type 1 pole with break-point at $\omega = p$