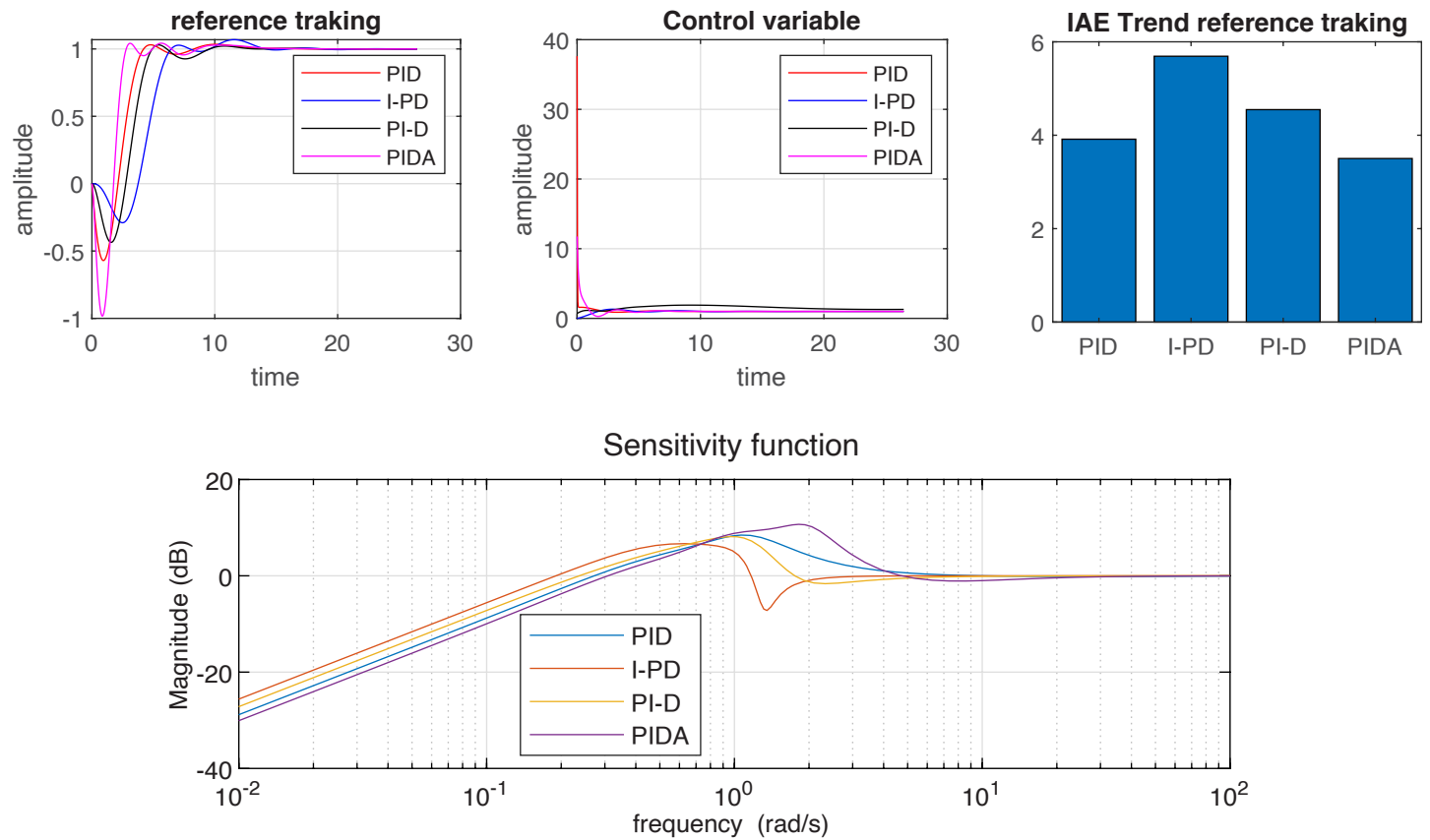


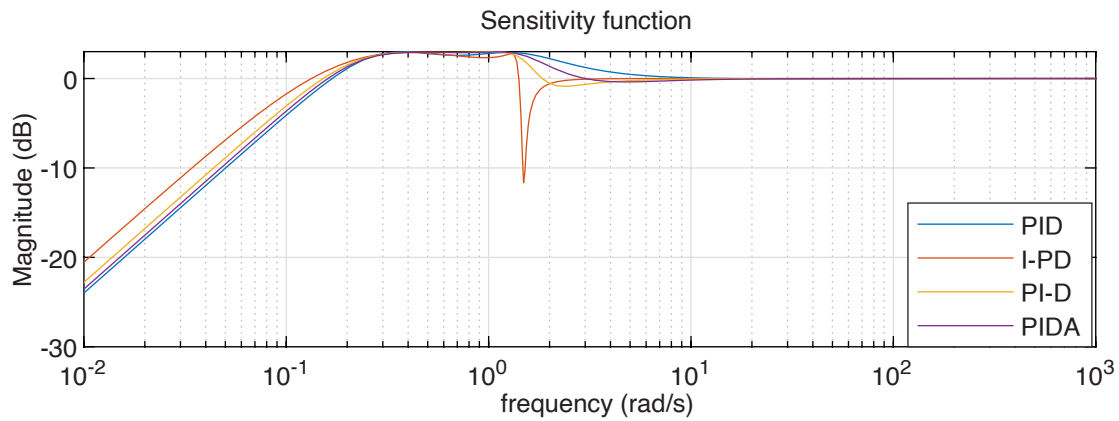
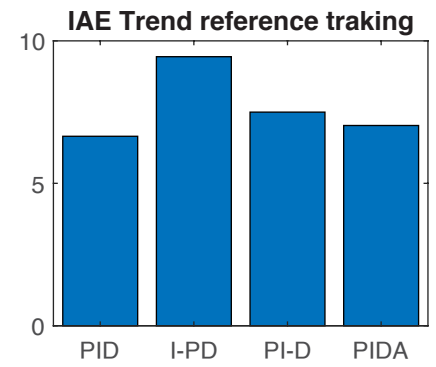
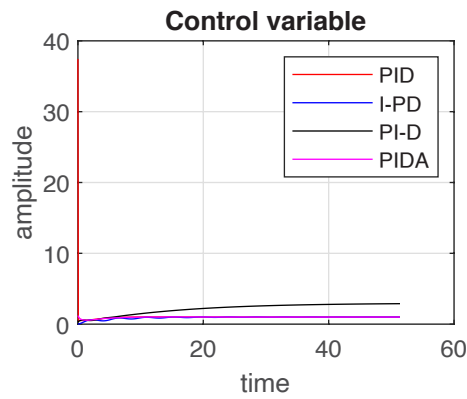
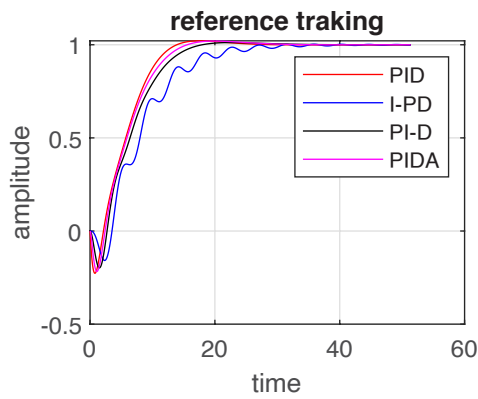
# Right Half Plane Zero 2

$$G(s) = \frac{1 - 2s}{(s + 1)^3}$$

## Set Point Optimization

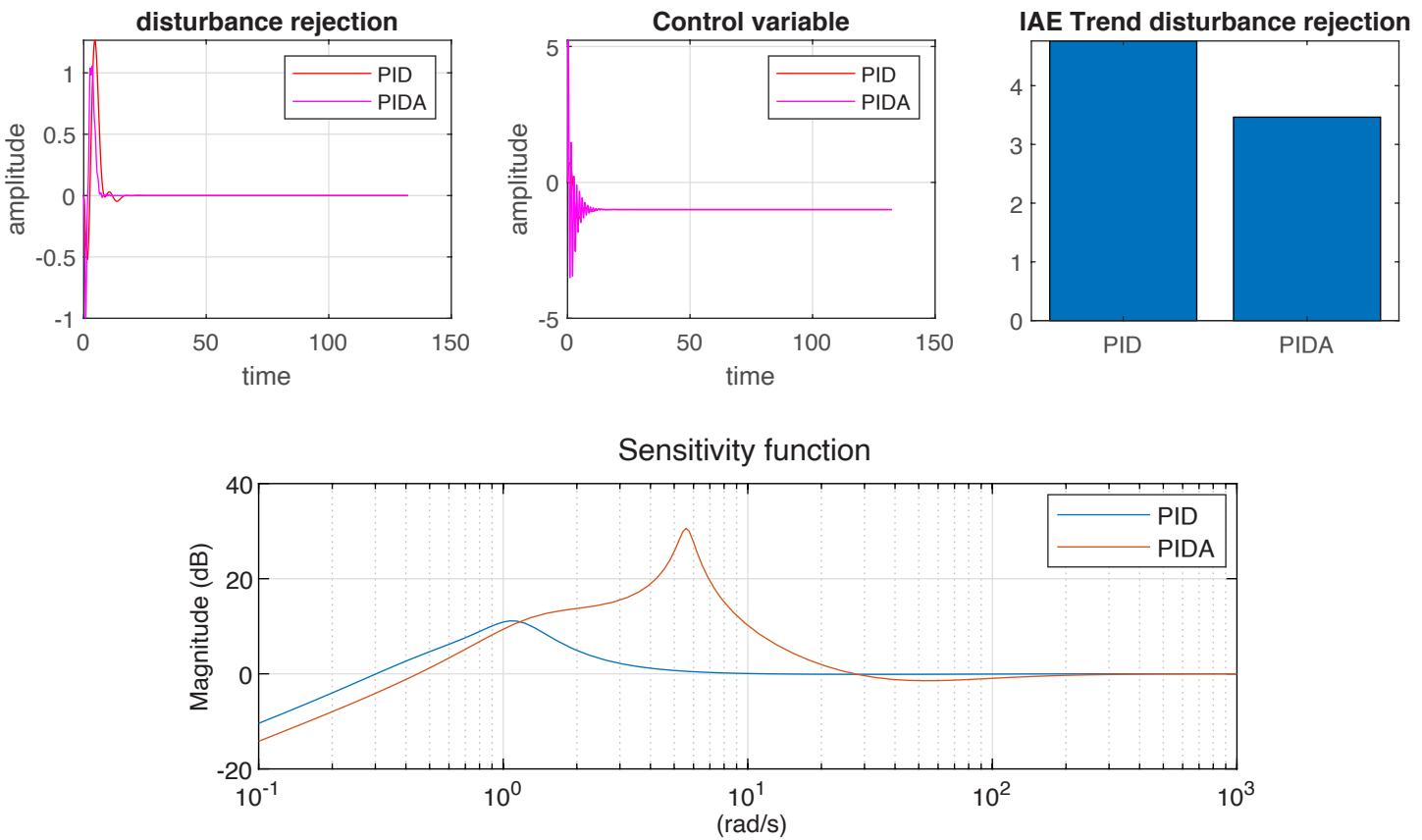


Parameters	PID	I-PD	PI-D	PIDA
Controller Transfer Function	$C(s) = \frac{1.669 s^2 + 1.812 s + 0.7054}{0.04436 s^2 + 2.551 s}$	$C_1(s) = \frac{0.3615}{s}$ $C_2(s) = \frac{0.8581 s + 0.8966}{0.02268 s + 1.0}$	$C_1(s) = 0.7127$ $C_2(s) = \frac{0.2282}{s}$ $C_3(s) = \frac{0.6708 s}{0.01717 s + 1.0}$	$C(s) = \frac{1.59 s^4 + 3.873 s^3 + 5.583 s^2 + 3.253 s + 0.8295}{0.1352 s^4 + 1.238 s^3 + 3.437 s^2 + 2.599 s}$
IAE	3,915113463	5,690966793	4,548331233	3,501399572
$K_p$	0,705378511	0,89660022	0,712735615	0,829457176
$T_i$	2,550846278	2,480548531	3,123110831	2,598851128
$T_d$	0,910409844	0,934358838	0,941149185	1,083979057
$T_a$				0,753431437
$N$	52,35009451	41,20043051	54,82845195	1,324940609
$\alpha$				2,987419413
$MS$	2.6493	2.1560	2.5548	3.4229
$PM$	51.5197	-54.3293	55.5992	48.6249
$GM$	1.6194	1.8663	1.6495	1.4329

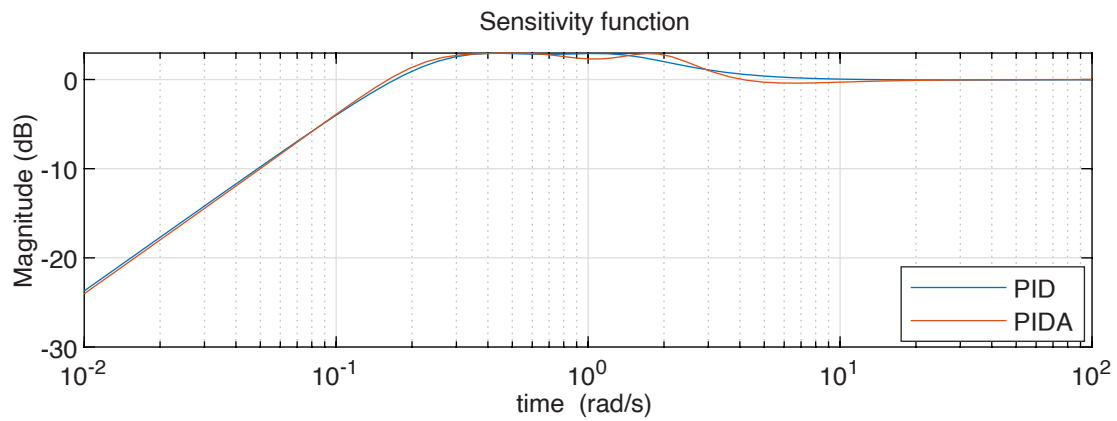
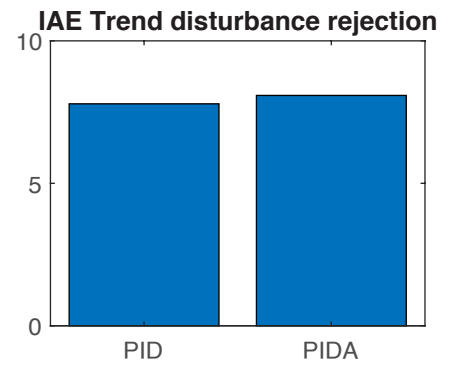
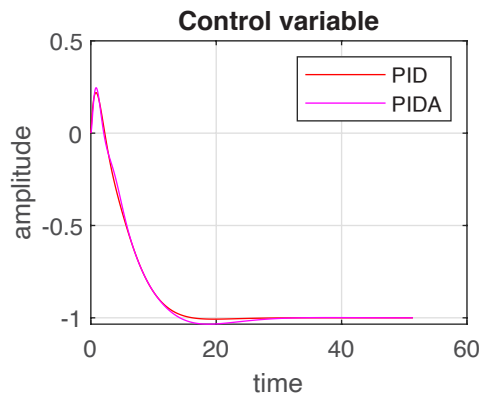
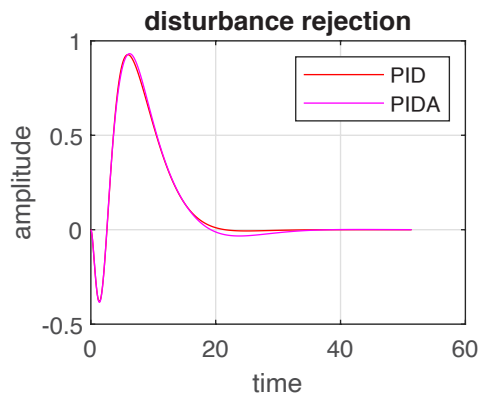


Parameters	PID	I-PD	PI-D	PIDA
Controller Transfer Function	$C(s) = \frac{0.6731 s^2 + 0.5927 s + 0.3056}{0.01798 s^2 + 1.93 s}$	$C_1(s) = \frac{0.1982}{s}$ $C_2(s) = \frac{1.057 s + 0.8653}{0.01187 s + 1.0}$	$C_1(s) = 0.33654$ $C_2(s) = \frac{0.1379}{s}$ $C_3(s) = \frac{0.7367 s}{0.01909 s + 1.0}$	$C(s) = \frac{1.638 s^4 + 2.943 s^3 + 2.926 s^2 + 1.305 s + 0.2656}{1.342 s^4 + 4.933 s^3 + 5.562 s^2 + 1.767 s}$
IAE	6,651196352	9,444302641	7,498965156	7,029730904
$K_p$	0,305591936	0,865310077	0,336542697	0,265610166
$T_i$	1,930322061	4,366167116	2,441181693	1,766621229
$T_d$	1,13180482	1,209554628	2,189011922	1,506062808
$T_a$				1,131174657
$N$	121,5306455	101,9309764	114,6693941	0,803225423
$\alpha$				1,776981538
$MS$	1,399999911	1,399998217	1,413205364	1,399999327
Gain Margin	3,506273472	3,813371321	3,446991092	3,44397108
Phase Margin	63,26387855	-57,01516127	65,44290551	64,04091517

# Disturbance Rejection Optimization



Parameters	PID	PIDA
Controller Transfer Function	$C(s) = \frac{1.867 s^2 + 2.051 s + 0.8302}{0.02921 s^2 + 2.458 s}$	$C(s) = \frac{0.268 s^4 + 1.885 s^3 + 4.363 s^2 + 4.133 s + 1.407}{0.0003115 s^4 + 0.02523 s^3 + 0.5807 s^2 + 2.723 s}$
IAE	4,762132088	3,464167873
$K_p$	0,830217066	1,407424495
$T_i$	2,458469727	2,723429337
$T_d$	0,902677062	0,921712956
$T_a$		0,433020144
$N$	75,97035316	5,772287959
$\alpha$		16,17939401
$MS$	3.6106	33.8264
$PM$	41.7891	-4.2930
$GM$	1.3924	1.0346



Parameters	PID	PIDA
Controller Transfer Function	$C(s) = \frac{0.6792 s^2 + 0.6834 s + 0.3226}{0.02796 s^2 + 2.105 s}$	$C(s) = \frac{1.256 s^4 + 1.962 s^3 + 2.397 s^2 + 1.114 s + 0.2559}{0.502 s^4 + 2.764 s^3 + 4.417 s^2 + 1.61 s}$
IAE	7,790453851	8,084766966
$K_p$	0,322556786	0,255873323
$T_i$	2,105467574	1,610212471
$T_d$	0,986778878	2,008037884
$T_a$		1,243097404
$N$	74,31201609	1,034307563
$\alpha$		3,102019411
$MS$	1,399993761	1,399999205
$GM$	3,525878471	3,667708638
$PM$	65,23253166	62,22772966





**Disturbance Rejection Optimization**

