Leak-optimized fast-LQG-IC HPF; slow LQG noise=0.0, fast LQG noise=12.589, f cutoff $leak_slow=0.9$, $leak_fast=0.999999$, r0 NCP = 0.6m10³ 2.0 Closed-loop residual (rad²/ 1.0 This controller atm error at f X (1.4, 0.4) integrator ncp error at f X 10¹ Reference ro ncp error at f Y X error (rad) 0.5 noise error_at_f_X 1.5 cost cutoff freq. 10^{-1} 0.0 1.0 -0.510⁻³ -1.010⁻⁵ 0.5 $10^{-3} \ 10^{-2} \ 10^{-1} \ 10^{0} \ 10^{1} \ 10^{2}$ 0.6 0.81.0 1.4.62.0 4.0 6.0 -1.0-0.50.0 0.5 NCP ro (m) Frequency (Hz) X = 1.013 radY = 1.266 rad10² 10² Open-loop atm Open-loop NCP 10⁰ 10⁰ Power (rad²/Hz) 10³ Open-loop noise 10⁻² 10⁻² Closed loop at X Closed loop at Y ETF ETF 10-4 10⁰ 10^{-4} phi_to_X|² Lfast_to_X|² |phi_to_Y|² |Lfast_to_Y|² 10⁻⁶ 10^{-6} 10⁻³ Lslow to X 2 Lslow_to_Y|2 10⁻⁸ 10⁻⁸ Nfast_to_X|2 Nfast_to_Y|2 Nslow to X Nslow to Y 10⁻¹⁰ 10^{-10} $10^{-3} \ 10^{-2} \ 10^{-1} \ 10^{0} \ 10^{1} \ 10^{2}$ $10^{-3} \ 10^{-2} \ 10^{-1} \ 10^{0} \ 10^{1} \ 10^{2}$ $10^{-3} \ 10^{-2} \ 10^{-1} \ 10^{0} \ 10^{1} \ 10^{2}$ Frequency (Hz) Frequency (Hz) Frequency (Hz) 1.01349330×10^{0} 1.0250 1.10 1.01349330×10^{0} 1.0225 1.01349330×10^{0} 1.08 X error error 1.0200 1.01349330×10^{0} 1.06 \times 1.01349330×10^{0} 1.0175 1.04 1.01349330×10^{0} 1.0150 1.02 1.01349330×10^{0} -8.05 -8.00 -7.95 -7.90 1.0 1.5 -8.100.5 2.0 15 20 25 30 log_lqg_noise_slow log_lqg_noise_fast f_cutoff 1.5 1.0135040×10^{0} 1.0135020×10^{0} error 1.0135000×10^{0} 1.3 1.0134980×10^{0} 1.2 1.0134960×10^{0} 1.0134940×10^{0} 1.1 1.0134920×10^{0} 1.0

9.99990 90991999 $\overline{2}$ 90991999 $\overline{5}$ 90991999 $\overline{7}$ 510.80 $\overline{0}$ $\overline{0}$ 000×10 $\overline{0}$

leak_fast

0.50

leak_slow

0.25

0.00

0.75

1.00