Leak-optimized IC-HPF; gain\_slow=2.0, gain\_fast=0.58, f\_cutoff=45.5 leak\_slow=0.9, leak\_fast=0.99999, r0 NCP = 0.6m 10<sup>3</sup> 1.0 1.0 This controller -atm\_error\_at\_f\_X -ncp\_error\_at\_f\_X (1.4, 0.4) integrator 0.9 (rad) ncp\_error\_at\_f\_Y Reference ro esidual 10<sup>1</sup> 0.5 noise\_error\_at\_f\_X cost cutoff freq. 0.8 error  $10^{-1}$ 0.0 -0.5 $10^{-3}$ -1.0 $10^{-5}$ 0.5 0.6 0.8 1.0 1.4.6 2.0 6.0 -0.54.0 NCP ro (m) Frequency (Hz) Y = 1.149 radX = 0.741 rad10<sup>2</sup> 10<sup>2</sup> Open-loop atm 10<sup>0</sup> 10<sup>0</sup> Open-loop NCP  $(rad^2/Hz)$ 10<sup>3</sup> Open-loop noise 10<sup>-2</sup> 10<sup>-2</sup> Closed loop at X Closed loop at Y 10<sup>0</sup>  $10^{-4}$ -|phi\_to\_Y|² |Lfast\_to\_Y|² | |phi\_to\_X|2 |Lfast\_to\_X|2  $10^{-6}$  $10^{-6}$ 10<sup>-3</sup> Lslow\_to\_X|2 Lslow\_to\_Y|2 10<sup>-8</sup> |Nfast\_to\_X|2 |Nslow\_to\_X|2 10<sup>-8</sup> -|Nfast\_to\_Y|<sup>2</sup> -|Nslow\_to\_Y|<sup>2</sup>  $10^{-10}$  $10^{-10}$  $10^{-3} \quad 10^{-2} \quad 10^{-1} \quad 10^{0}$  $10^{-3} \quad 10^{-2} \quad 10^{-1} \quad 10^{0}$  $10^{-3} 10^{-2} 10^{-1} 10^{0} 10^{1} 10^{2}$ Frequency (Hz) Frequency (Hz) Frequency (Hz) 0.744 0.748 0.7450 error 0.7425 0.746 0.743 0.7400 0.744 0.742 0.7375 0.742 0.741 0.60 0.65 1.90 2.00 2.05 0.55 35 50 55 1.95 2.10 0.50 40 45 gain\_slow gain\_fast f\_cutoff  $7.41160 \times 10^{-1}$ 0.90  $7.41140 \times 10^{-1}$ X error 0.85  $7.41120 \times 10^{-1}$ 0.80  $7.41100 \times 10^{-1}$  $7.41080 \times 10^{-1}$ 0.75 9.999000 9.999000 9.9999 9.9999 9.9999 9.9999 9.9999 9.9999 9.9999 9.9999 9.9999 9.9999 9.9999 9.9999 9.9999 9.9999 9.9999 9.9999 9.9999 9.9999 9.99990.00 0.25 0.75 1.00 0.50 leak\_fast leak slow