

The upgraded telescope control system performance for the Canada-France-Hawai'i-Telescope

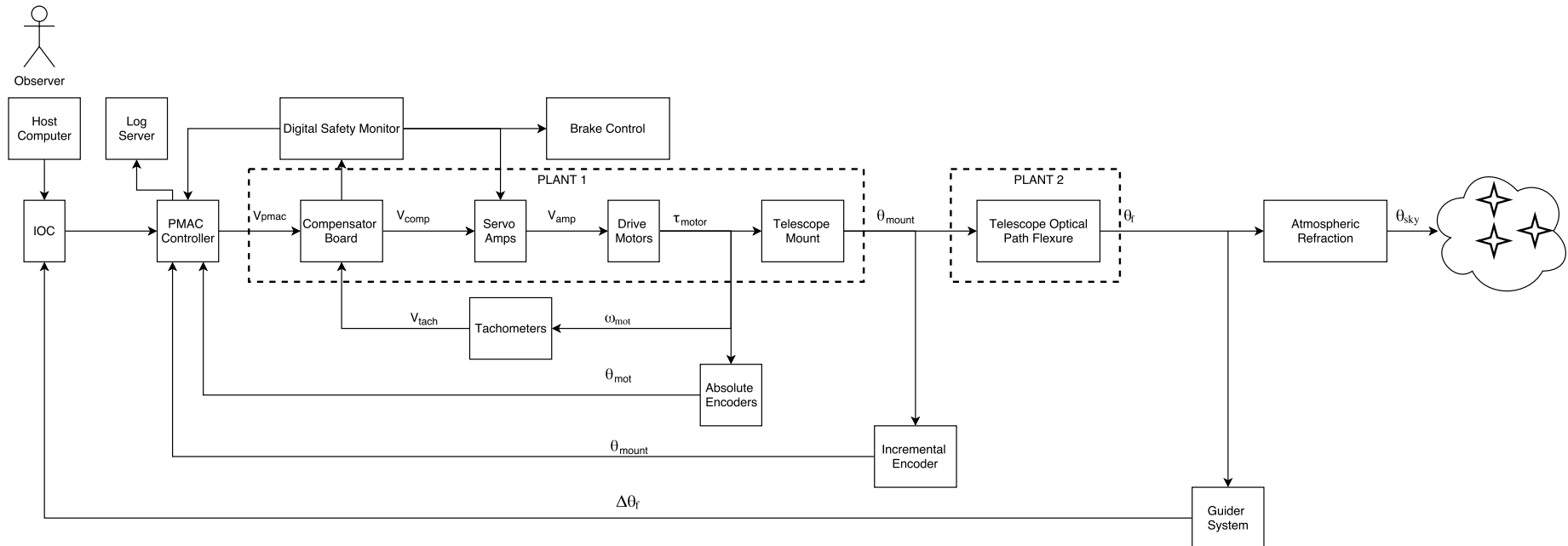
Windell Jones-Palma

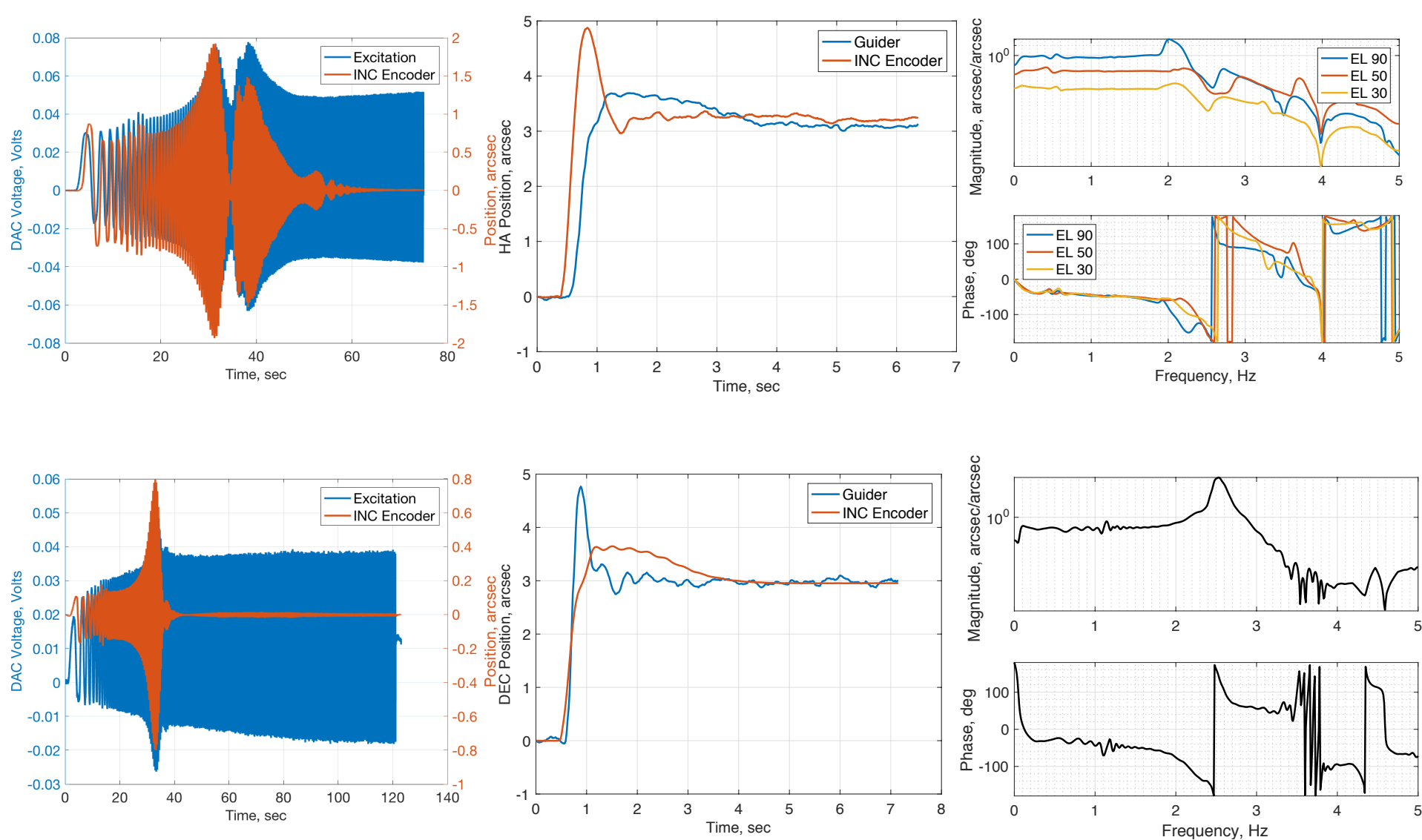
Upgrade Need:

1. Replace obsolete Canadian-Marconi Servo controller, made of analog amplifiers and 1970s 74 series ICs, with a modern equivalent.

Outline:

1. Identify the closed-loop transfer function that combines the open-loop response of telescope with the Power PMAC controller frequency response.
2. Quantify the performance of the currently implemented design.

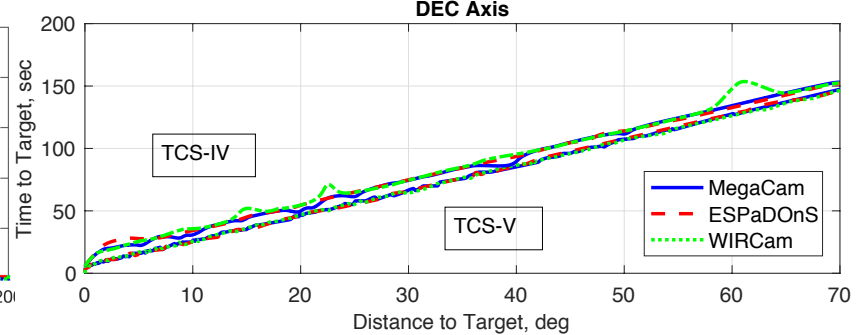
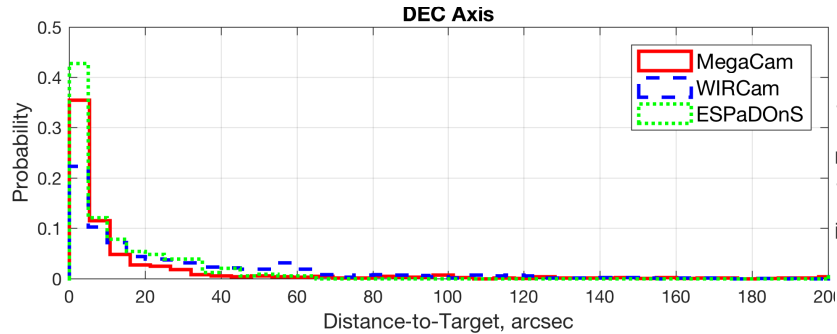
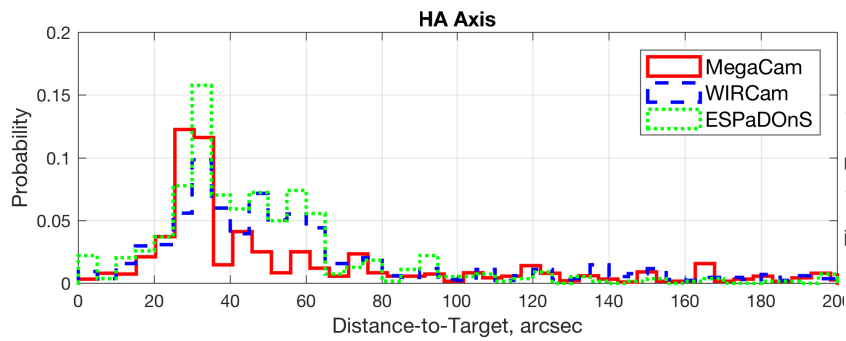




$$G(\omega) = \frac{P_{uy}}{P_u}$$

Cross power spectral density of the input and output

Input power spectral density



Instrument	Validated Observing Time (hrs/yr)	Instrument Time (nights/yr)	TCS-IV Motion Time (hrs/night)	TCS-V Motion Time (hr/night)
Espadons	882.20	125	0.23	0.16
MegaCam	802.67	178	0.67	0.50
WIRCam	167.24	62	0.85	0.24

On average 4.2 minutes for Espadons, 10.2 minutes for MegaCam, and 36.6 minutes for WIRCam are recovered per night as a result of using TCS-V over its predecessor.