

# Simulating In-Orbit Performance for the CASTOR Telescope.

*Monday, August 19, 2024 3:45 PM (10 minutes)*

The Cosmological Advanced Survey Telescope for Optical and uv Research(CASTOR) has been undergoing detector testing for the new CIS-303 detectors. Understanding the detector effects and optimizing CASTOR's capabilities is a critical element needed to prepare the mission for launch by the end of this decade. To this end, A simulation pipeline was developed to generate in-flight simulation and characterization of these CMOS-based detectors. The detector simulation pipeline combines ESA's Pyxel framework with various photometric tools to generate dark current profiles, cosmic ray effects, readout electronics, and optical point spread functions for each of CASTOR's three passbands. The dark current is characterized by a widget that allows visualization of the expected number of "hot" pixels for varying current per unit area. A Geant-4 based Cosmic ray generation model which pre-exists in Pyxel is finetuned for the circumpolar orbit of CASTOR. Various star profiles are FFT convolved with PSFs from an optical chain simulation carried out by Honeywell, resulting in a full-width half maximum of  $0.14''$ . These tools are then applied to a realistic distribution of stellar sources from CASTOR's Phase 0 survey, yielding expected results.

## What area of study best describes your talk?

Physics

## If you answered 'Other', please provide the study area.

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