# Cycle 23 COS NUV Dark Monitor Summary

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**ABSTRACT**

*Here we summarize the Cycle 23 NUV Dark Monitoring Program for the Cosmic Origin Spectrograph (COS) on the Hubble Space Telescope (HST) covering dates November 2015 to October 2016. We give an overview of the calibration plan and summary for this calibration program.*

## Contents

## 1. Introduction

This program is designed to perform routine monitoring of the NUV MAMA detector dark rate. The main purpose is to look for evidence of a change in the dark, both to track on-orbit time dependence and to check for any developing detector problems. Results from this program are used to update the ETC. Every two weeks, two 22-minute exposures were taken with the shutter closed for a total of 52 orbits. All observations were successful.

## 2. Analysis and Results

The global dark rate of each observation was measured, and the overall trend was monitored as a function of time. The data, initially fit well with a linear relation, now shows a slower increase with time and larger variability, the latter being induced by temperature and seasonal changes (Figure 1). Due to the changing trend with time, we adopt an ETC estimate for the dark-rate that corresponds to the 95% level in the probability distribution function determined from dark measurements over a period of the previous 6 months to 1 year.

## 3. Summary

The COS NUV detector dark rate continues to follow former trends. The overall trend continues to slowly increase linearly with larger variability.
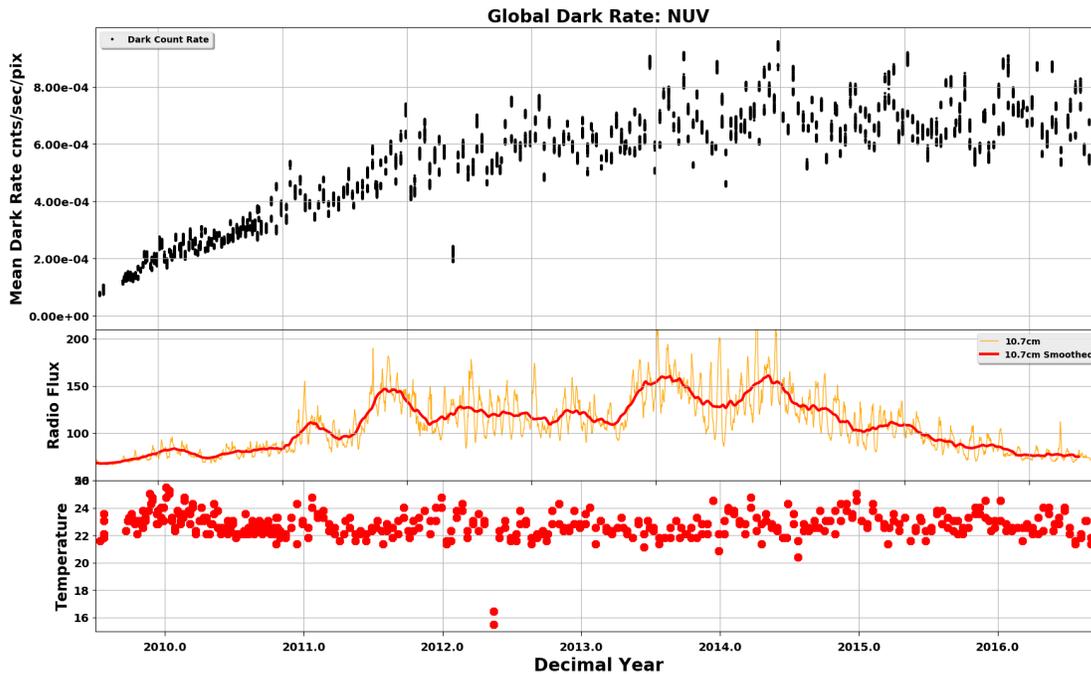


**Figure 1.**: COS NUV dark rate as a function of time, from the COS installation through Cycle 23. The first subplot shows the measured dark-rate in 25 second increments throughout every observation. The groupings of points represent individual exposures, and demonstrate that the variability within a given exposure is low. The middle subplot displays the 10.7 cm radio flux used to track the solar cycle, and the last subplot displays the detector temperature for each observation.