

SRE-05-12

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VIRS Calibration Changes

Prepared by: Rachel Klima & the MASCS team

1. Introduction

This report describes calibration changes implemented to simplify the handling of dark subtractions for VIRS, and an adjustment to the DATA_QUALITY_INDEX provided in the data records. All data have been updated to use the latest calibration and will be included in PDS release 9.

2. Calibration Changes:

2.1. Dark Subtraction Algorithm

- The default dark current fitting algorithm now models the dark current as a function of temperature instead of time for all cases except for extremely short (less than 1.5 minute) data records. Previously, only data records with 25 or more dark observations were fit as a function of temperature. The rationale for fitting the short data records as a function of time is that the temperature variations over such short timescales are not captured with the precision necessary to model the dark current as a smooth function of temperature.
- The dark polynomial fitting algorithm has been changed from POLY_FIT to SVDFIT and now incorporates the thermal noise estimation, as derived from dark quick-cal measurements, as measurement errors during fitting. This provides a smoother fit to the dark solution that is less sensitive to noise, particularly on short data records.

2.2. DATA_QUALITY_INDEX

- An index term was added to the DATA_QUALITY_INDEX to warn users when the exclusion of saturated dark measurements has resulted in three or fewer dark observations being used in the polynomial fit for one or more pixels. The DATA_QUALITY_INDEX is of the form ABCD-EFGH-IJKL-MNOP. Digit N now displays a '0' when all dark fits in the CDR were calculated using at least four shuttered dark observations, and a '1' when one or more pixels were modeled using three or fewer shuttered dark observations.