OSIRIS

Optical, Spectroscopic, and Infrared Remote Imaging System

OSIRIS camera bad pixel list

RO-RIS-MPAE-TN-080

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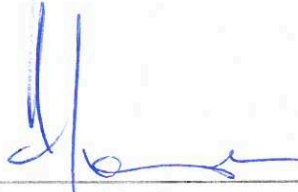21/02/2018

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Iss./Rev.	Date / Author	Pages affected	Description
1 / -	29/06/2015 G. Kovacs	all	first release
1 / a	22/2/2017 G. Kovacs	Sec. 3	Section added
1 / b	21/02/2018 C. Güttler	Sect. 2 and 3	Adding NAC "scar" area to uncorrected bad pixel Harmonization of format

Table of contents

1 General aspects

1.1 Scope

This document describes the current bad pixel list of the OSIRIS NAC and WAC. It also specifies their correction methods.

1.2 Introduction

The OSIRIS cameras are built with a 2048x2048 high quality scientific CCD. These devices may contain blemishes, which must be corrected during the image calibration process. Bad pixels are produced:

- during the manufacturing of the detector
- during integration of the camera system
- in-flight

1.3 Applicable Documents

no.	document name	document number, Iss./Rev.
AD1	OSIRIS Experiment Data Record and Software Interface Specification (EDR/SIS)	RO-RIS-MPAE-ID-018
AD2	Rosetta-OSIRIS to Planetary Science Archive Interface Control Document	RO-RIS-MPAE-ID-015

1.4 Reference Documents

no.	document name	document number, Iss./Rev.
RD1	OSIRIS user manual	RO-RIS-MPAE-UM-004, D/s
RD2	OSIRIS Calibration Report	RO-RIS-MPAE-RP-147, D/b
RD3	OSIRIS Calibration Pipeline OsiCalliope	RO-RIS-MPAE-MA-007, 1/d

2 Bad pixel list

2.1 Correction method

The bad pixels are corrected by replacing their DN values by the median (or average) of the neighboring good ones. Lines or clusters can also be corrected by shifting their DN values to match the adjacent line or cluster. The implemented methods are called:

- *SHIFT_X_CORR* [**X**= L or R]
- *MEDIAN_CORR*
- *NO_CORR*

Details on the correction methods can be found in [RD3].

2.2 NAC bad pixels

The current bad pixels list is applicable to all OSIRIS flight data.

2.2.1 Bad pixels and correction methods

No individual bad pixels are known or corrected.

2.2.2 Bad columns and correction methods

Column 995 is a bad column, with further effect on the neighboring columns (C994 and C996). The method first corrects columns 994 and 996 by shifting their values to match in average with C993 and C997. Column 995 is then corrected by replacing each of its pixels DN with the median of 6 neighboring column pixels.

The following correction is implemented:

> *COLUMN = (994, 0, SHIFT_L_CORR)*
> *COLUMN = (996, 0, SHIFT_L_CORR)*
> *COLUMN = (995, 0, MEDIAN_CORR)*

2.2.3 Bad rectangular regions and methods

The NAC "blob" area is a rectangular area with effectively higher (dark) noise. This is marked in the image quality map, but currently not corrected.

Moreover, the "scar" area is a V-shaped feature from a particle sticking on the CCD surface. The particle is scattering light and dimming the pixels below. The feature is mostly corrected by the high-frequency spatial flat-fielding but should be treated with care in some cases and, in particular, for photometry. The feature is not corrected by the bad-pixel algorithm but marked in the quality map.

The following is implemented in the database:

> *AREA_R = (915, 970, 20, 20, NO_CORR)*
> *AREA_R = (1559, 645, 14, 24, NO_CORR)*

2.3 WAC bad pixels

The current bad pixels list is applicable to all OSIRIS flight data.

2.3.1 Bad pixels and correction methods

No individual bad pixels are known or corrected.

2.3.2 Bad columns or clusters and correction methods

The WAC has one bad cluster at column 119, for line 1664 and larger.

The following correction is implemented:

COLUMN = (119, 1664, MEDIAN_CORR)

2.3.3 Bad rectangular regions and methods

No rectangular regions are known or corrected.

3 Calibration files used by OsiCalliope

The calibration files used by OsiCalliope to calibrate OSIRIS images are:

- NAC_FM_BAD_PIXEL_V01.TXT
- WAC_FM_BAD_PIXEL_V01.TXT
- NAC_FM_BAD_PIXEL_V02.TXT

Previous versions:

- NAC_FM_ BAD_PIXEL_LIST.LBL
  (obsolete, same values as NAC_FM_BAD_PIXEL_V01.TXT)
- WAC_FM_ BAD_PIXEL_LIST.LBL
  (obsolete, same values as WAC_FM_BAD_PIXEL_V01.TXT)