

Creating WFPC2 Dark Reference Files: Addendum

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ABSTRACT

In this report, we describe recent updates to the procedures already in place for making WFPC2 dark reference files. These updates include the ability to create dark reference files by using either weekly or daily dark images as input. They also allow the user to specify the year of the WFPC2 superdark image which is compared to the output dark file during processing. The new scripts are currently available for FTP from the WFPC2 website to users who wish to create dark reference files which are tailored to closely match the date of their HST observations. This ISR is written as a supplement to Instrument Science Report WFPC2 2001-001 and is not intended to serve as a stand-alone document.

Obtaining the IRAF scripts

All the tools necessary for making dark reference files are available for FTP from the WFPC2 Dark Reference File Website:

http://www.stsci.edu/instruments/wfpc2/Wfpc2_memos/wfpc2_darks_tab.html

The FTP file linked by this website contains several cl scripts, text files, and images and requires about 50 MB of disk space to download. Among these files are the superdark images for various years: 1999, 2000, and 2001.

Selecting Input Darks

When retrieving a set of dark images from the archive, keep in mind that there are separate dark monitoring programs. The first of these takes darks at roughly weekly intervals and the second takes darks on a daily basis. "Weekly" dark images are taken in sets of five and

have exposure times of 1800 sec each. “Daily” dark images are taken in sets of three and are only 1000 sec each. The dark *images* you select as input will be combined to make the output dark reference *file*.

To achieve the same *exposure time* as a weekly dark reference file, you would thus need 9*1000 sec exposures to equal 5*1800 sec exposures. (The readnoise will be slightly higher when using 9 images, though is not a significant increase compared with the dark count rate.).

These scripts are designed to handle only dark images of 1800 or 1000 sec, though any number of input files may be used. The specific number of files used is left to the discretion of the user. When selecting the input images, try to keep them as close as possible to the date of your observations and be sure that the images you select are all taken within the same decontamination cycle. Decontamination cycle boundaries (decon dates) are listed at http://www.stsci.edu/instruments/wfpc2/Wfpc2_memos/wfpc2_decon_dates.html.

Making the Darks

The **wkdark** task links together the following 4 tasks: **superimg**, **superdqf**, **doheader**, **calcheck**, each of which are described in detail in ISR WFPC2 2001-001. Before running this task, four input parameters must be defined. (The first two parameters are described in the previous ISR.)

mk> **wkdark**

Rootname of Previous Dark (kau1324lu):

Useafter Date (Jan 25 2000 05:05:05):

Superdark Year (2001):

Are infiles daily or weekly? (weekly):

The “Superdark Year” should be chosen to match the date of the HST observations you wish to recalibrate. Superdark images are currently available for 1999, 2000, and 2001. As future superdark images are created, the FTP files from the web will be updated.

The last parameter indicates whether the input darks were taken from a weekly or a daily dark monitoring program. This allows the correct normalization: by 1843.6 seconds if the input images are weekly darks or by 1003.6 seconds if the input images are daily darks. These normalizations are slightly higher than the image exposure times because they include overhead times while the detector is waiting to be read out.

We note a minor clarification in the previous ISR’s description of how the scripts create the data quality files using the task **superdqf**. When comparing the current dark DQF with

the superdark DQF, the data quality value is assigned a value of '2' if the pixel value came from the current dark *and* if *crrej* used **less than half** of the total input frames, indicating that the pixel value was noisy or questionable. The previous ISR was worded "less than 3 of 5 of the input frames...". The scripts are now written to count the number of input files and to determine if less than half were rejected for a given pixel.

We also give caution when masking "bad regions" in the input dark frames. It is important not to "overmask" the effects of CTE (i.e. masking too many columns, too large a region, or the same region in all the dark images). If the same pixel is masked as bad in every input file, the output dark reference file will be set to zero at that pixel and the dark signal will not be properly subtracted when you recalibrate your observations.