

Application of crosstalk correction factor

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Outline

- This presentation examines how well application of the correction factor Andres measured corrects for the crosstalk.
- Conditions were no JFET, with preamp, science package in a Cube
- This examines crosstalk from right side to left side of one CCD measured with the “laser method”.
- It shows that the xtalk factor Andres found (0.006) was very close to optimal.
- We show that larger factors (0.007, 0.008) overcorrect

No JFET, preamp

- The following slides compare application of 3 different xtalk correction factors
- The images are in the **directory**
 - `/data/des03.c/data/typhoon/xt_s1_13_4us_cube`
- The **original image** is named
 - `mean.fits`
- The **left and right overscan corrected** areas of `mean.fits` are named
 - `lImagemos.fits`
 - `rImagemos.fits`
 - (mos = minus over scan)
- The **correction images** (the right side, reversed and multiplied by 0.00*) are named
 - `rightXtalkCorrection00*.fits`
- The **corrected images** (`lImagemos.fits - rightXtalkCorrection00*.fits`) are named
 - `leftXtalkCorrected00*.fits`

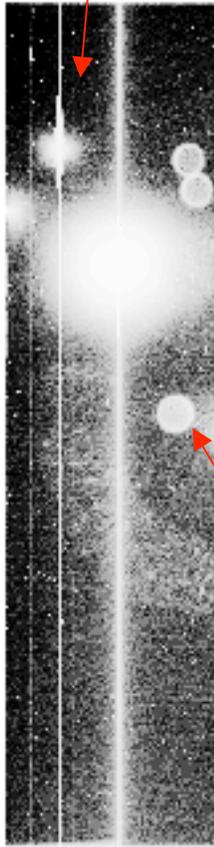
Results

- The original left side of the image with crosstalk and the result of applying 3 different xtalk correction factors are shown in the next slide
- Images illustrating more detail of the application of each of the correction factors and the resultant corrected images are shown in Slides 6,7,8.

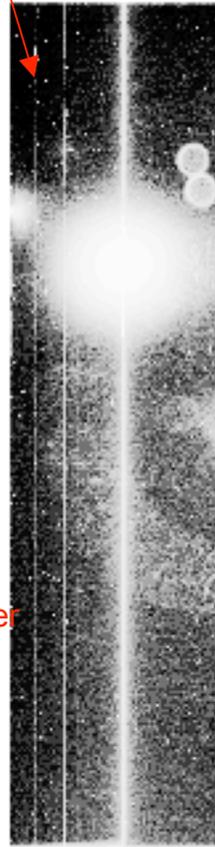
No JFET, with preamp

Effect of applying 3 different correction factors

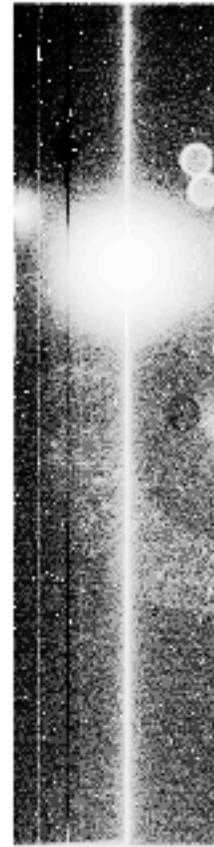
Notice that the xtalk from the light bulb is also removed



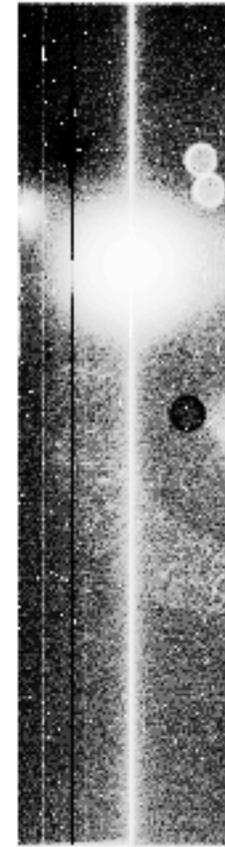
Original with Xtalk



XtalkCorrection = 0.006



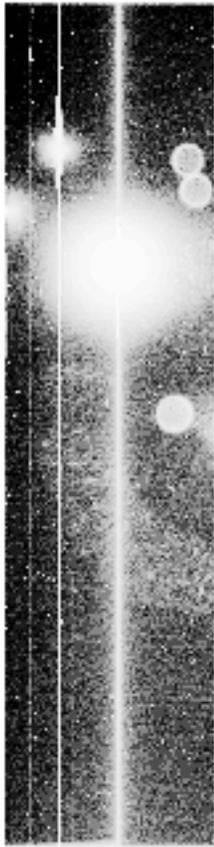
XtalkCorrection = 0.007



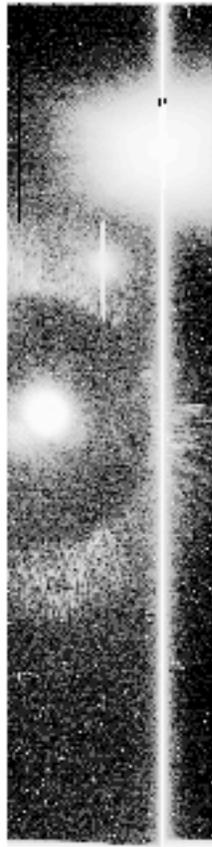
XtalkCorrection = 0.008

Xtalk from laser

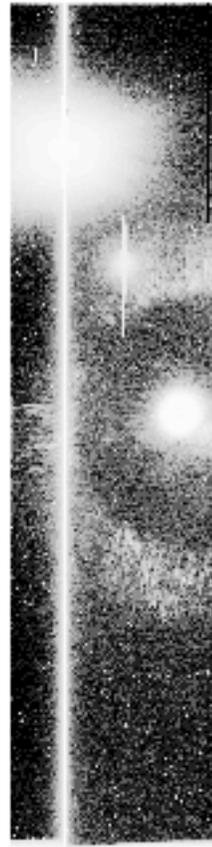
xtalk factor = 0.006



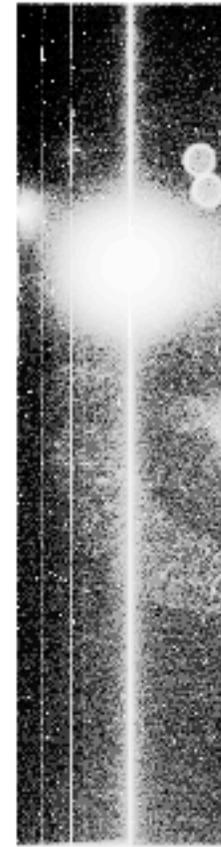
Left =
meanLeft minus overscan



Right =
meanRight minus overscan

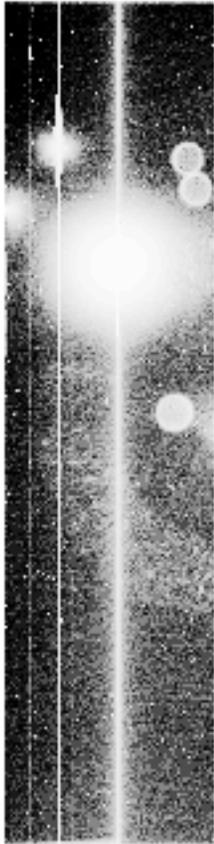


Correction =
 $0.006 * \text{REVERSE}(\text{Right})$

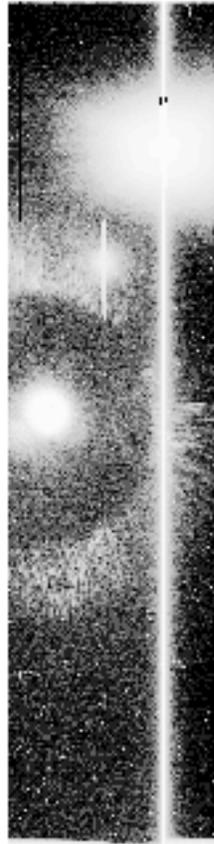


Left - Correction

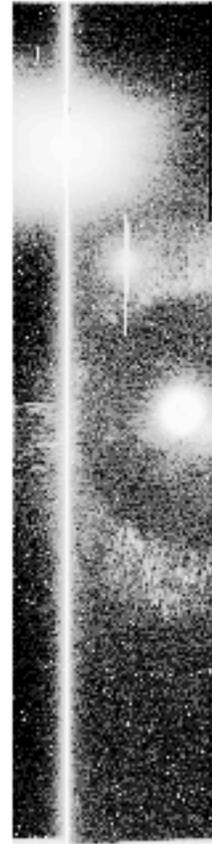
xtalk factor = 0.007



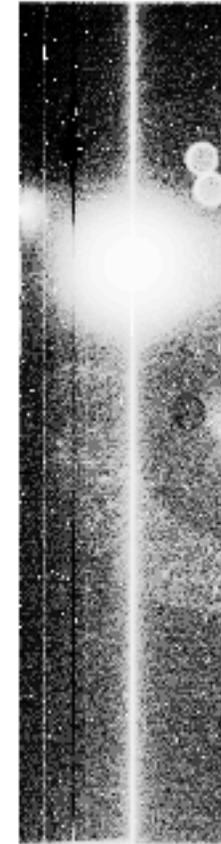
Left =
meanLeft minus overscan



Right =
meanRight minus overscan

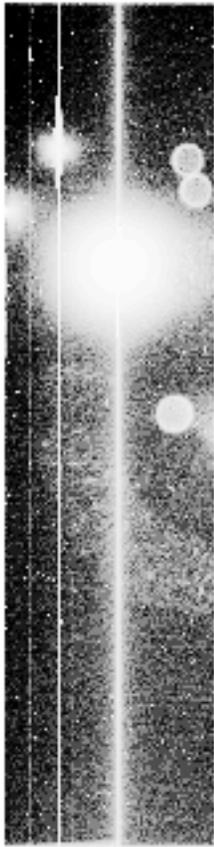


Correction =
 $0.007 * \text{REVERSE}(\text{Right})$

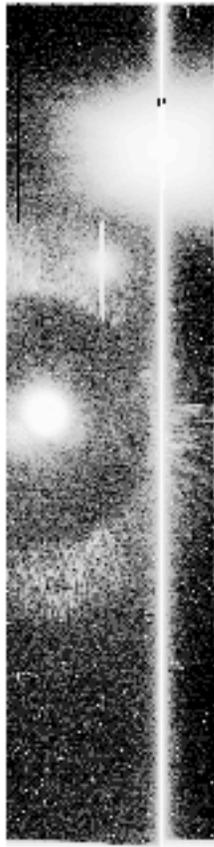


Left - Correction

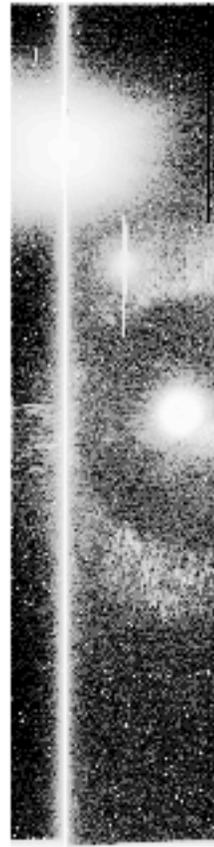
xtalk factor = 0.008



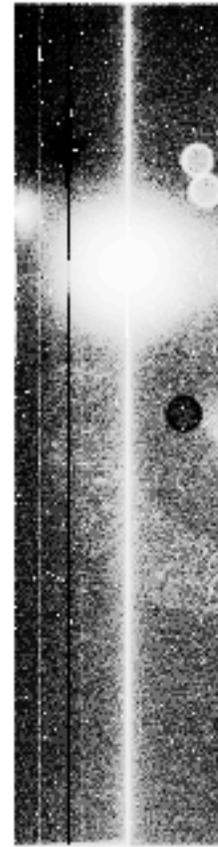
Left =
meanLeft minus overscan



Right =
meanRight minus overscan



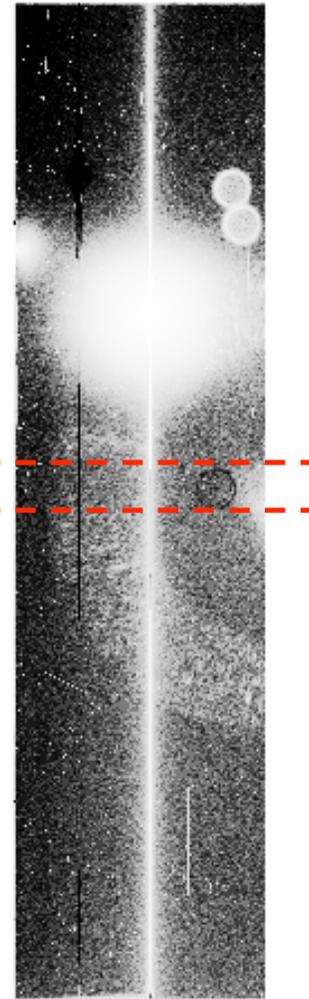
Correction =
 $0.008 * \text{REVERSE}(\text{Right})$



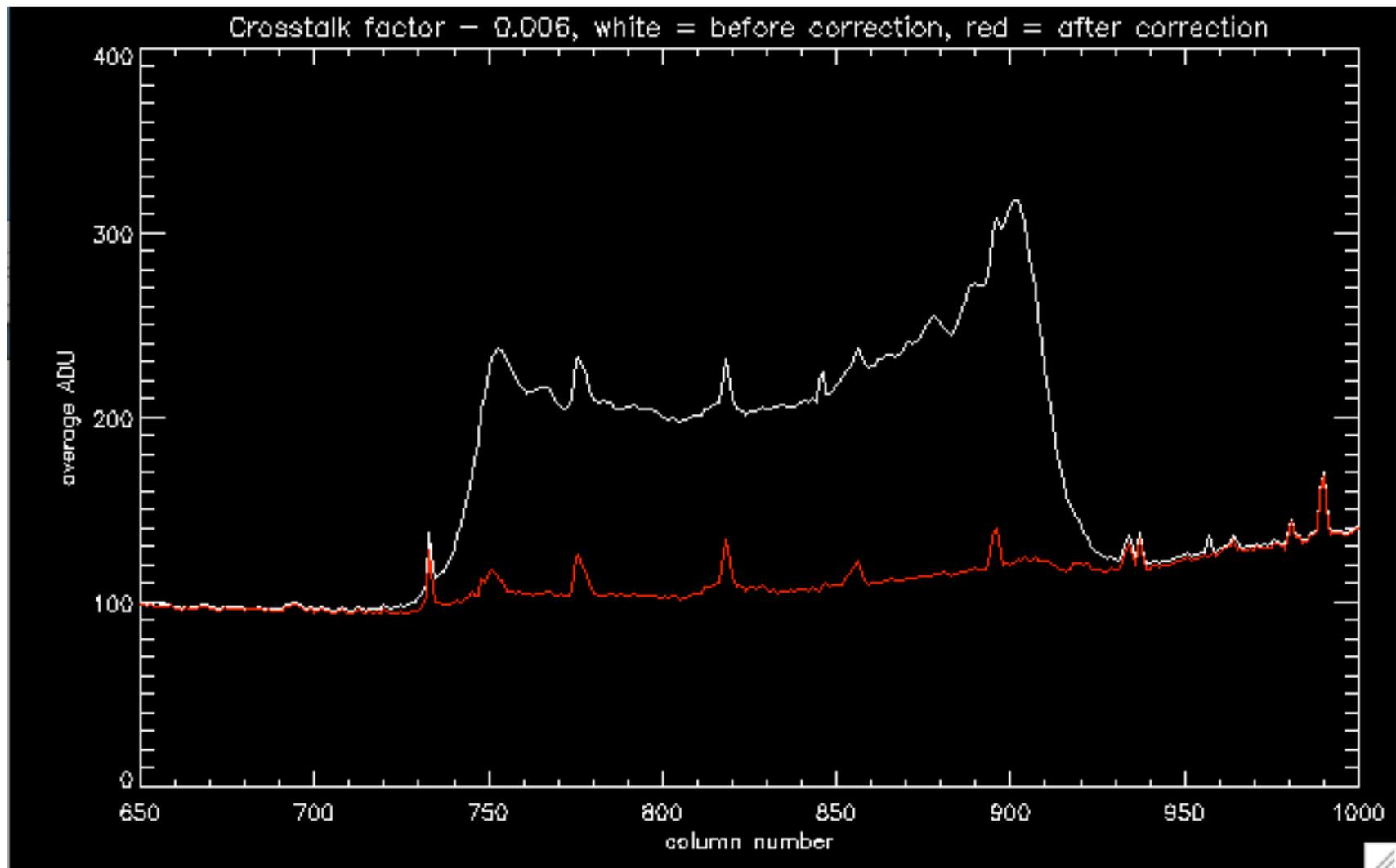
Left - Correction

Image profiles comparing uncorrected and corrected images

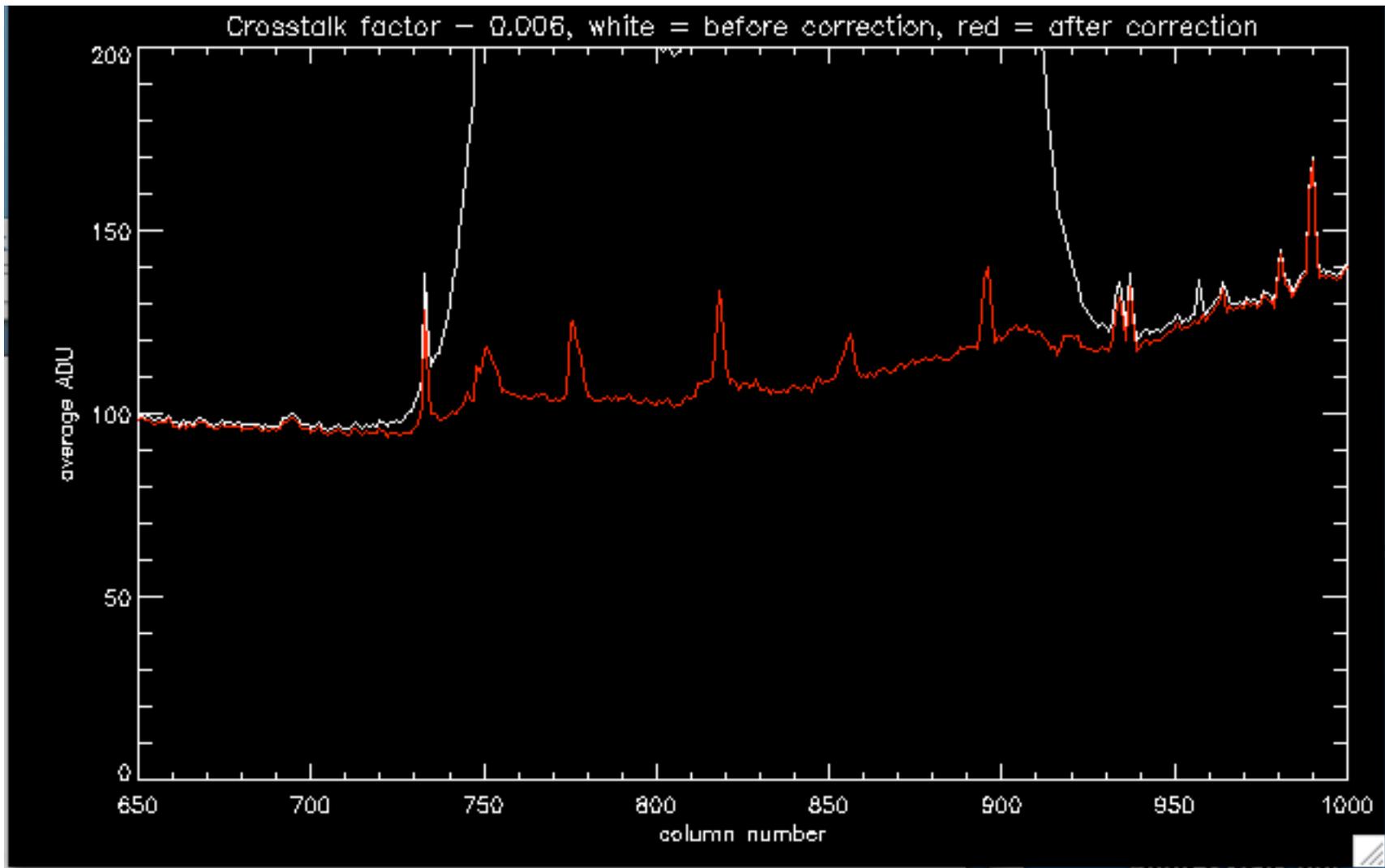
- The next plots show the average of the values from rows 2030 to 2150 (dotted lines) for the uncorrected and corrected images



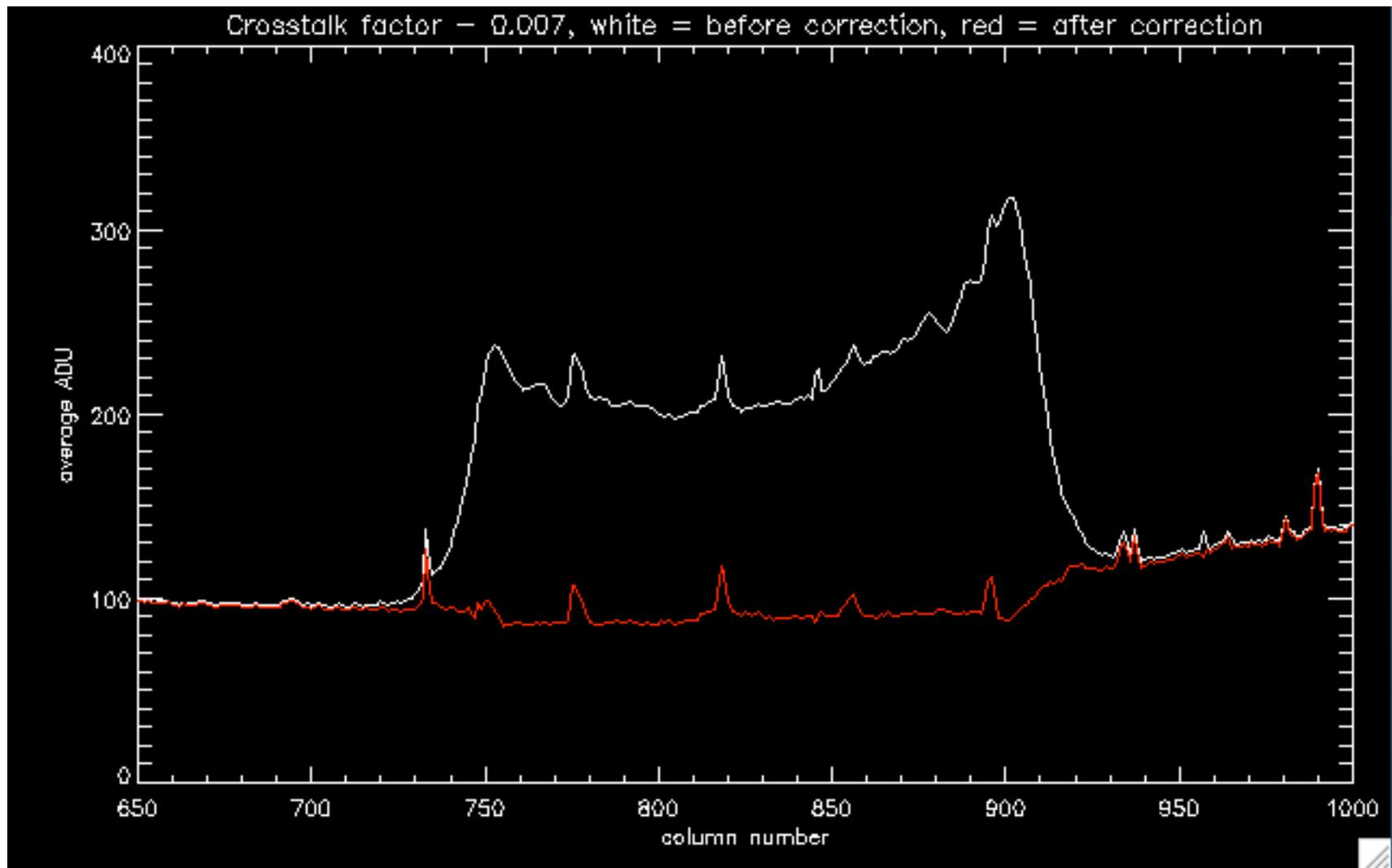
Correction factor = 0.006



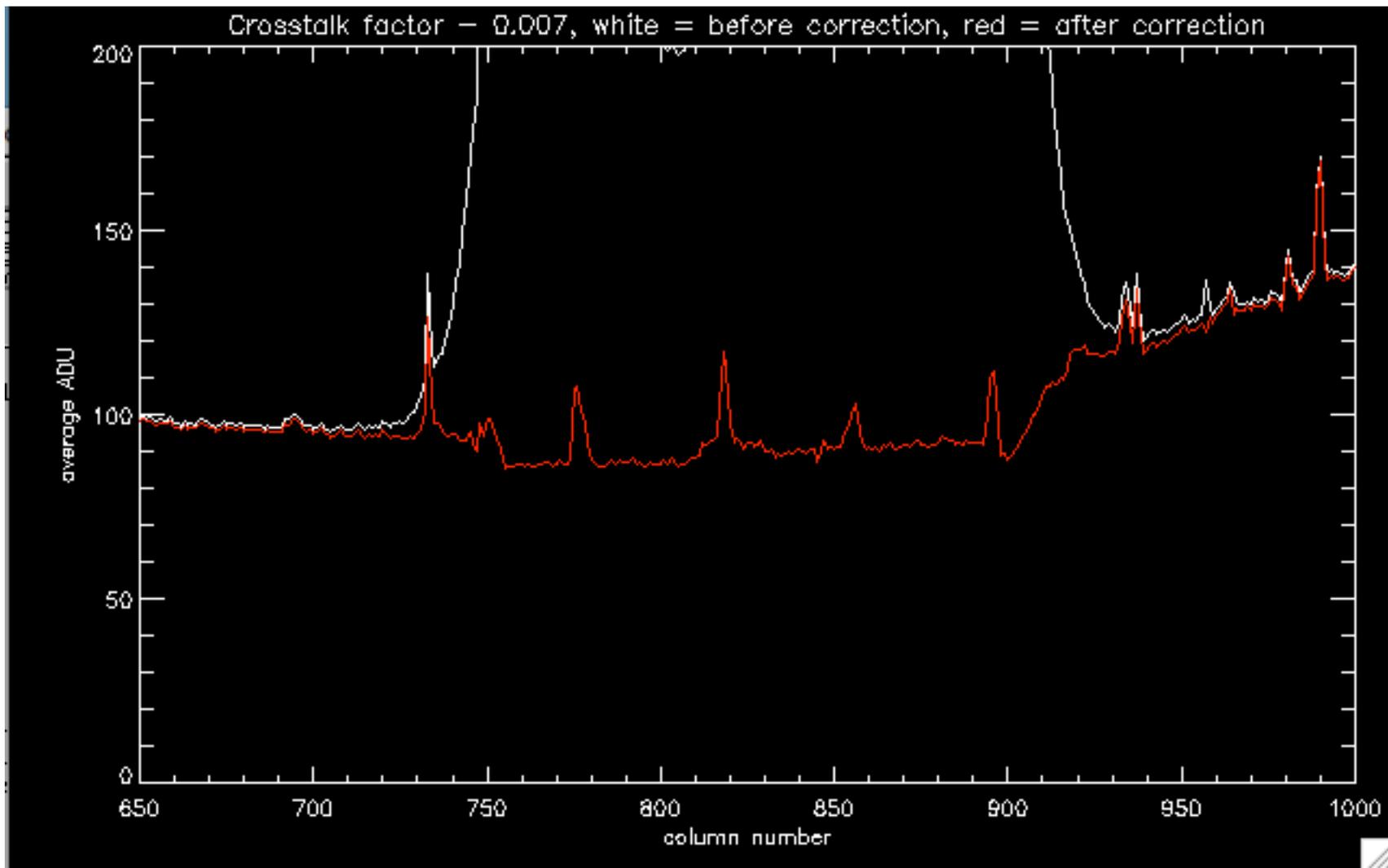
Correction factor = 0.006
ZOOM IN on corrected profile



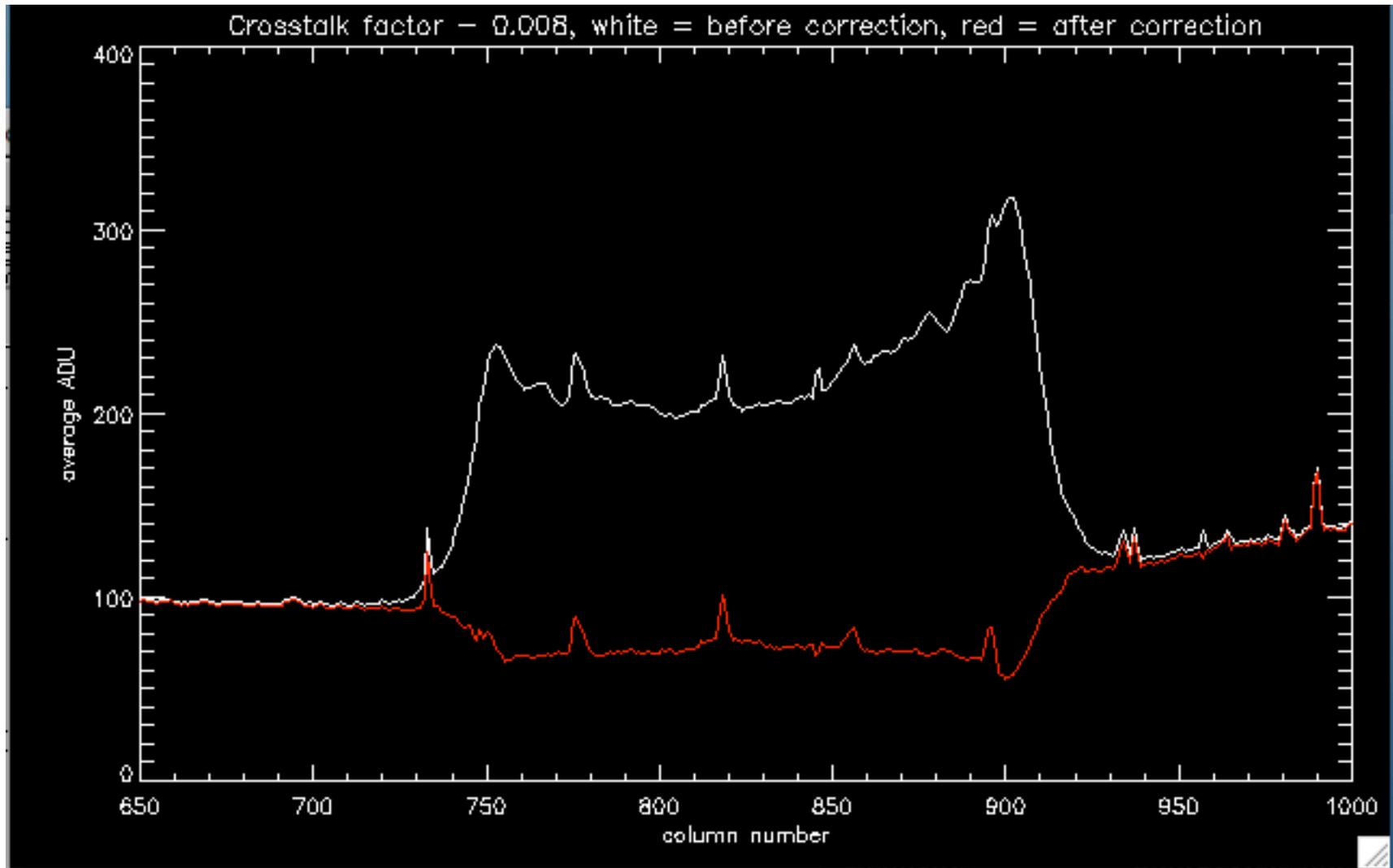
Correction factor = 0.007



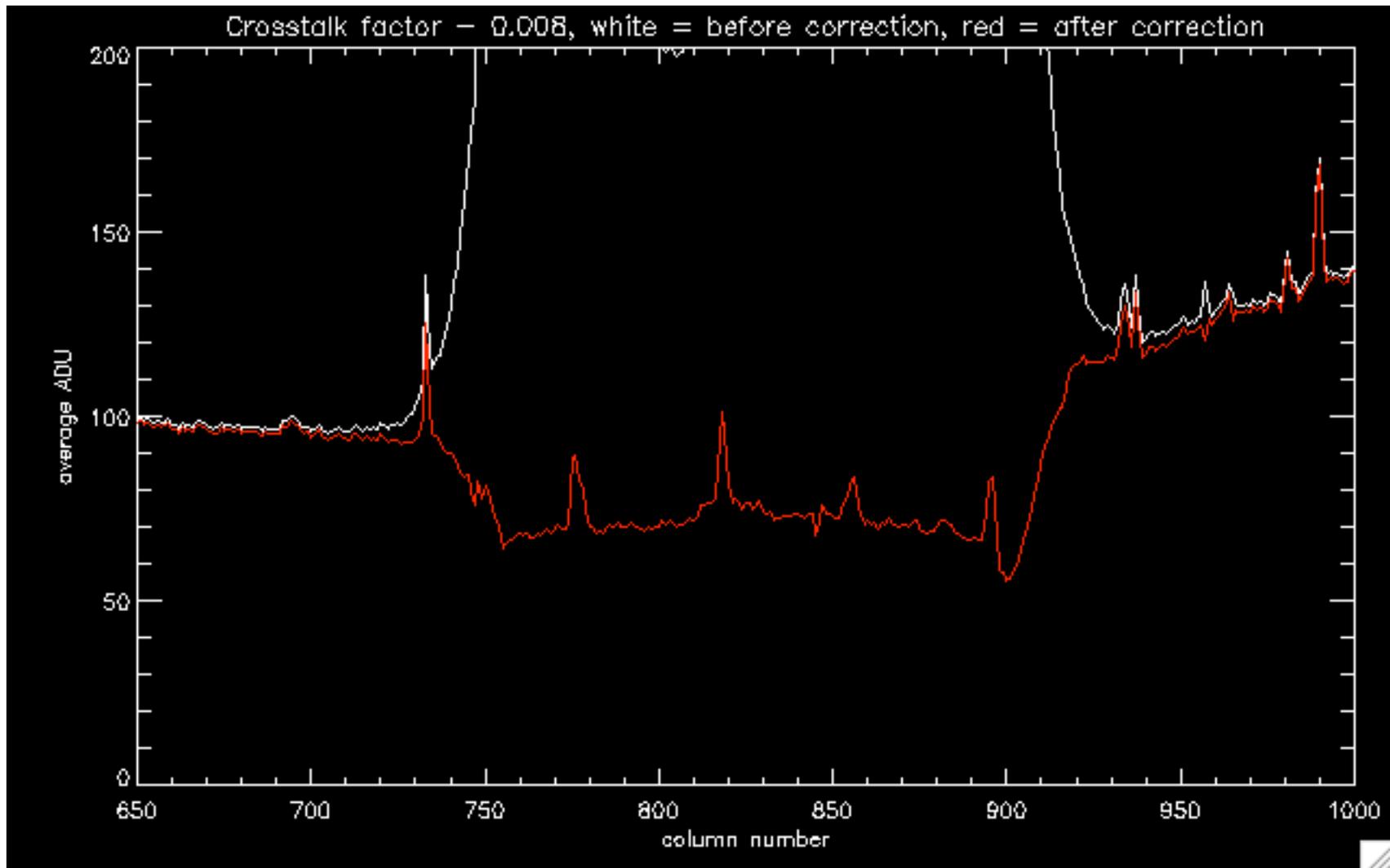
Correction factor = 0.007
ZOOM IN on corrected profile



Correction factor = 0.008

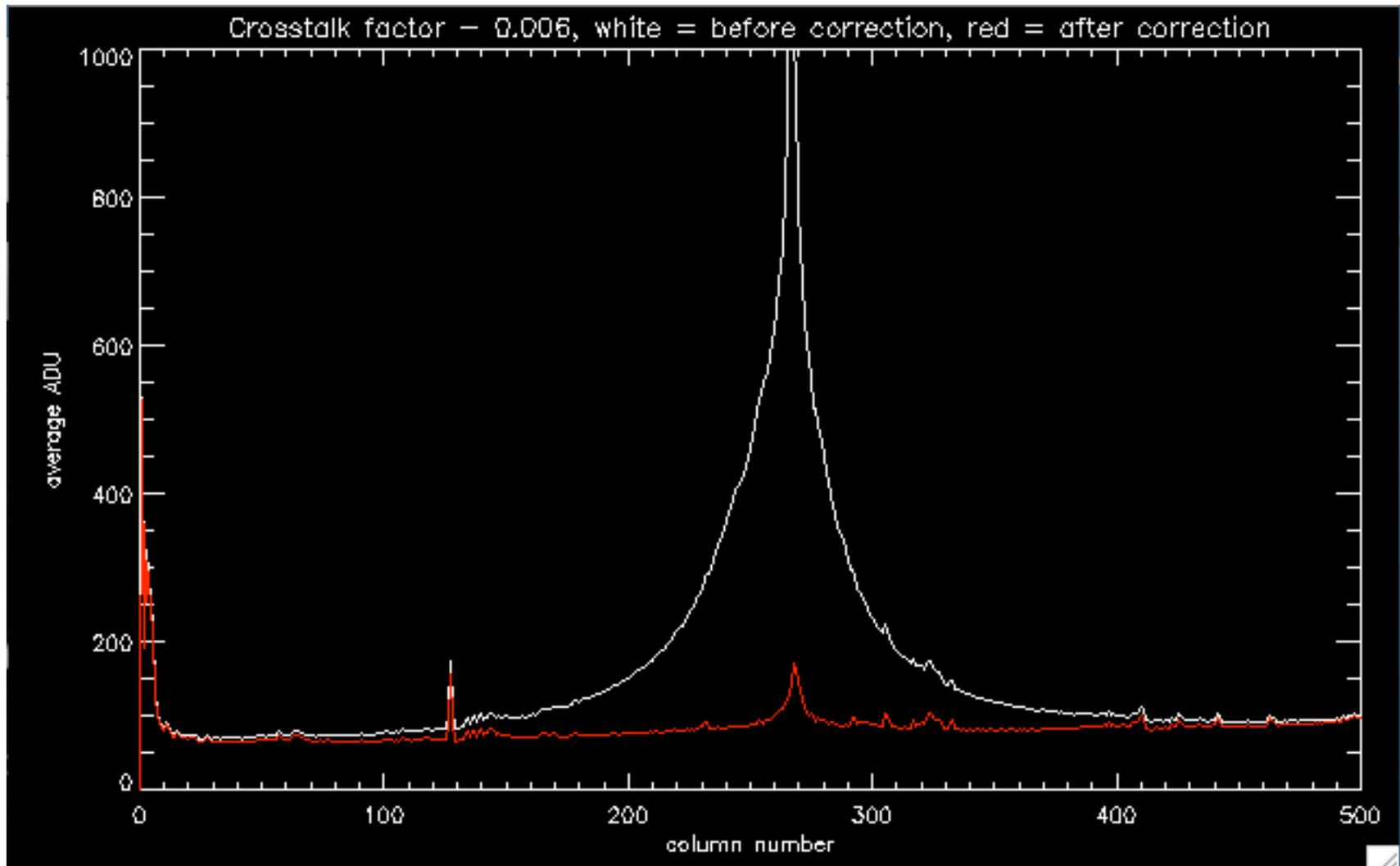


Correction factor = 0.008
ZOOM IN on corrected profile

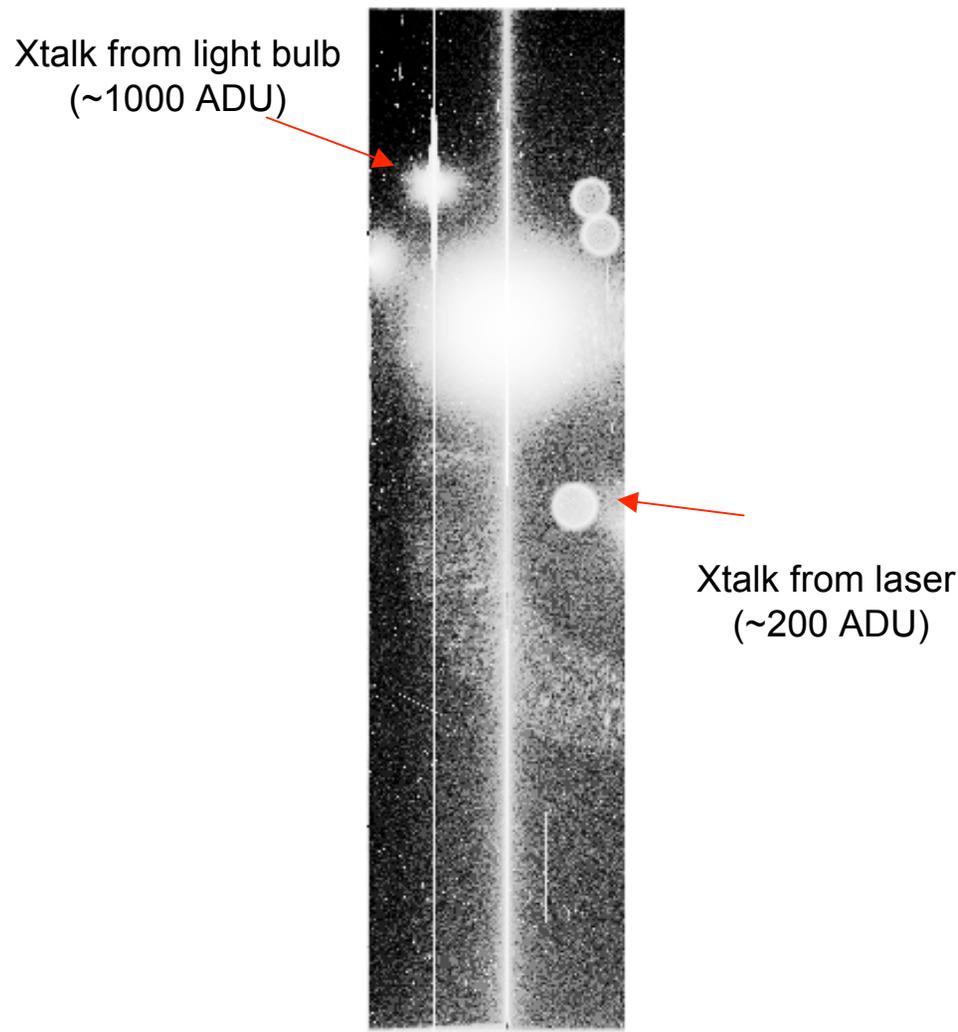


Correction factor = 0.006

This shows the profile across the xtalk, corrected and uncorrected,
from the light bulb in the upper left



Applicability of xtalk correction factor



- The correction factor was derived by measurements of the crosstalk produced by the laser, but, since the xtalk from the light bulb is also corrected, this indicates that
 - 1) The factor may be applicable to any/other region of the CCD
 - 2) The factor is not $f(\text{intensity})$, at least for the range between the xtalk from the laser (xtalk = ~200 ADU) and from the lightbulb (xtalk = ~1000 ADU)