

JWST/NIRSpec IFU – 1/f subtraction

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pipeline v1.8.2 with CTX 1148.pmap

Input: DARK uncal files

jw01121002001_02101_00001_nrs1_uncal.fits

jw01121002001_02101_00001_nrs2_uncal.fits

STAGE1 default outputs

jw01121002001_02101_00001_nrs1_rate.fits

jw01121002001_02101_00001_nrs2_rate.fits

(After subtracting median DN/s: [-0.00039322 -0.02471063])

single_column* 1/f correction outputs

jw01121002001_02101_00001_nrs1_1f_rate.fits

jw01121002001_02101_00001_nrs2_1f_rate.fits

single_column 1/f correction with masks from NSClean

jw01121002001_02101_00001_nrs1_1fmasked_rate.fits

jw01121002001_02101_00001_nrs2_1fmasked_rate.fits

NSClean inputs

jw01121002001_02101_00001_nrs1_rate.fits

jw01121002001_02101_00001_nrs2_rate.fits

(Median DN/s = [0 0])

NSClean outputs

jw01121002001_02101_00001_nrs1_cln_rate.fits

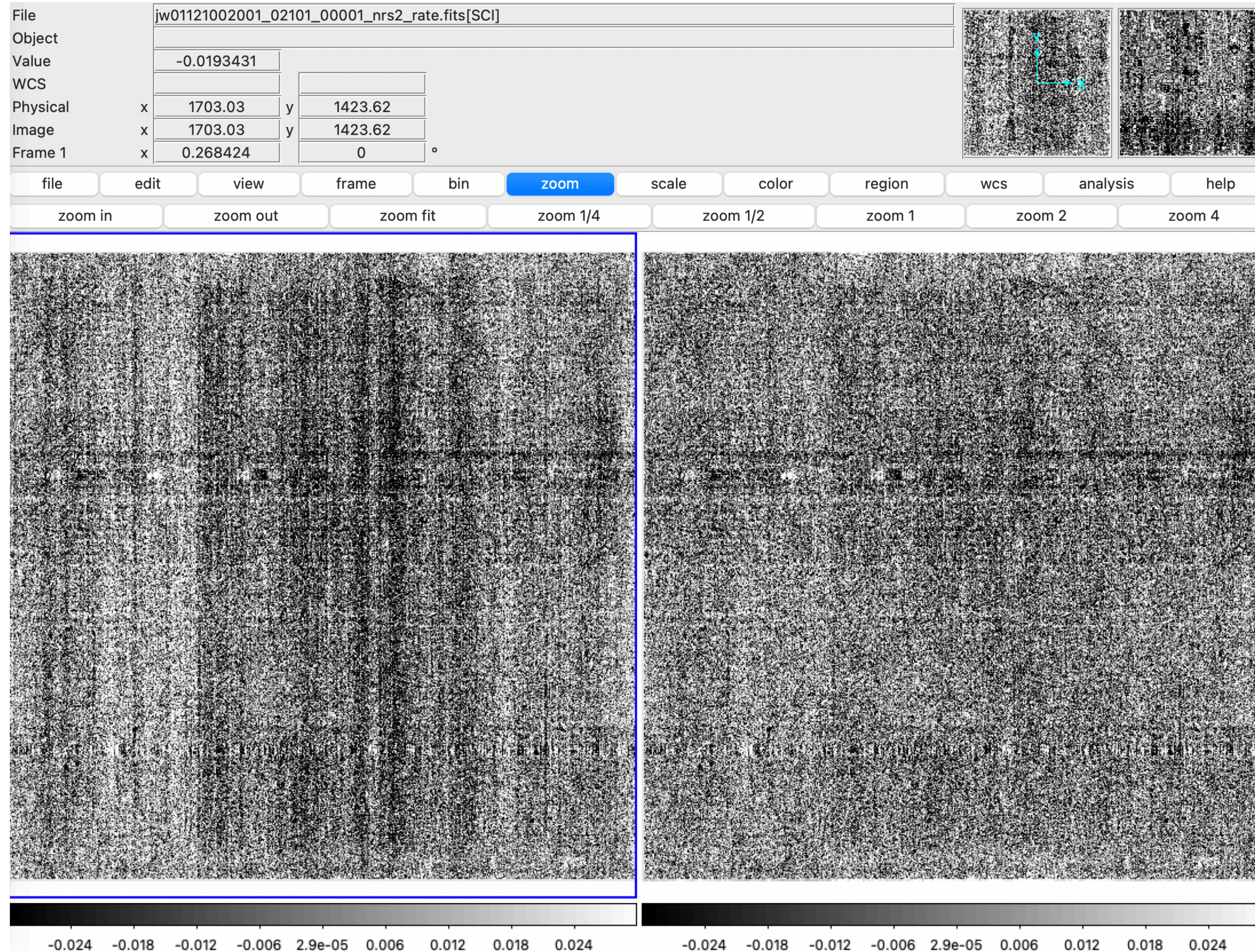
jw01121002001_02101_00001_nrs2_cln_rate.fits

(After subtracting median DN/s: [0.0002061 +0.0003288];

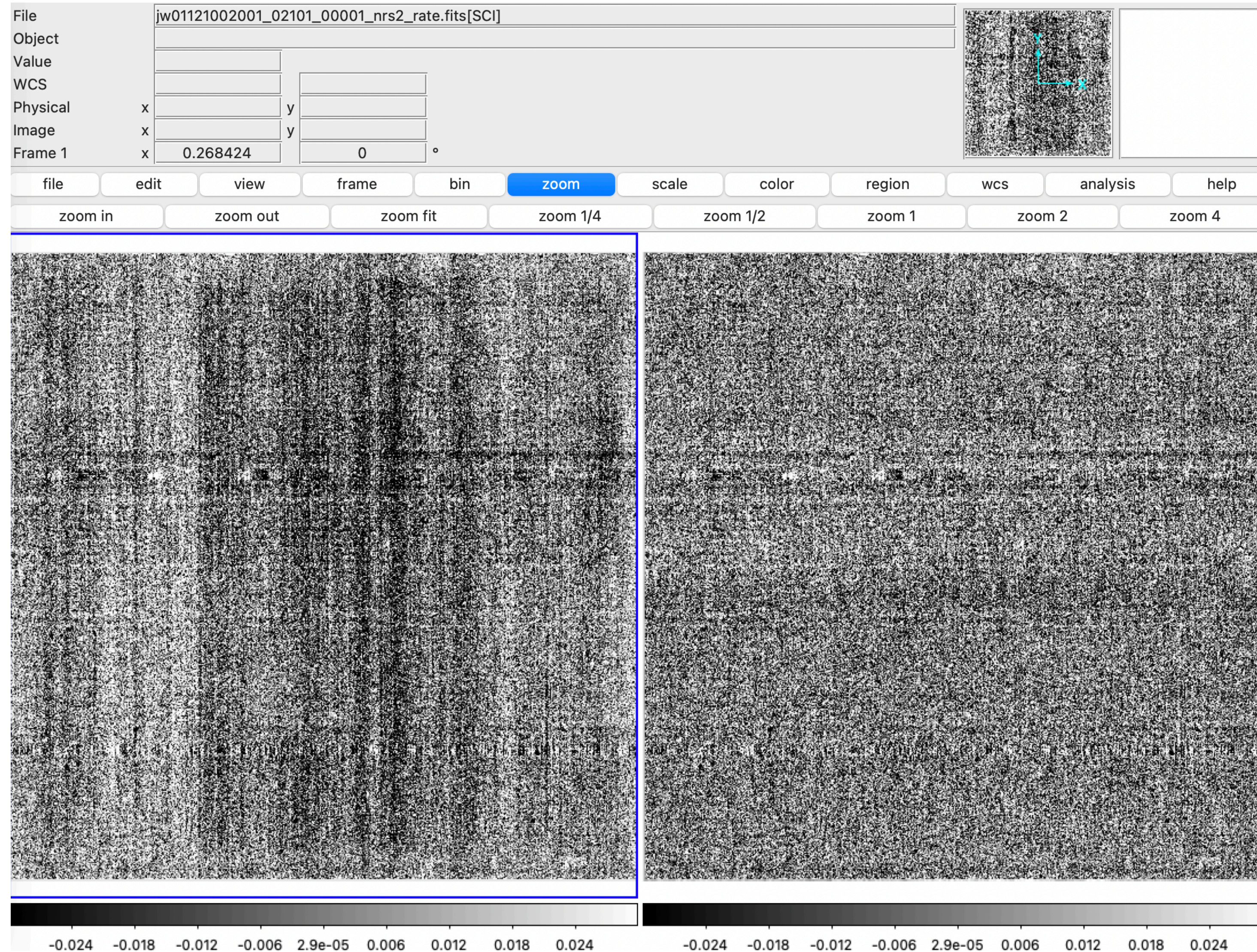
not clear why NSClean always adds a constant term)

* modelled in each column with a low-order polynomial, after removing all bright pixels (e.g. associated with observed target) with a σ -clipping algorithm

JWST/NIRSpec IFU – 1/f subtraction



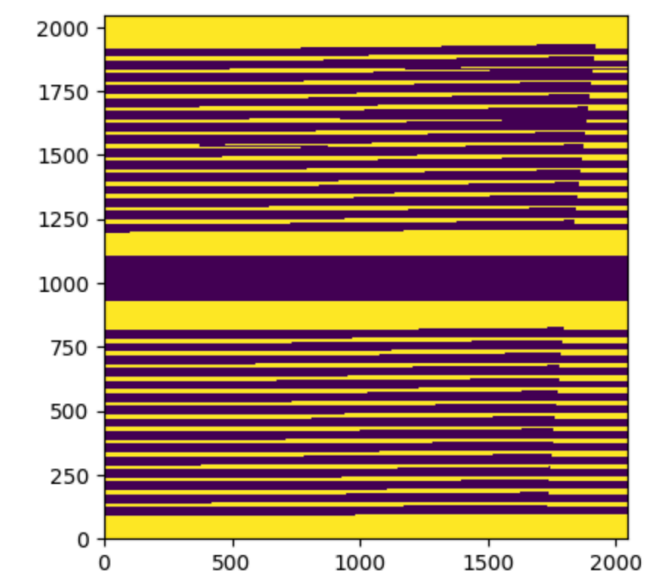
JWST/NIRSpec IFU – 1/f subtraction



STAGE1 default output,
NRS2

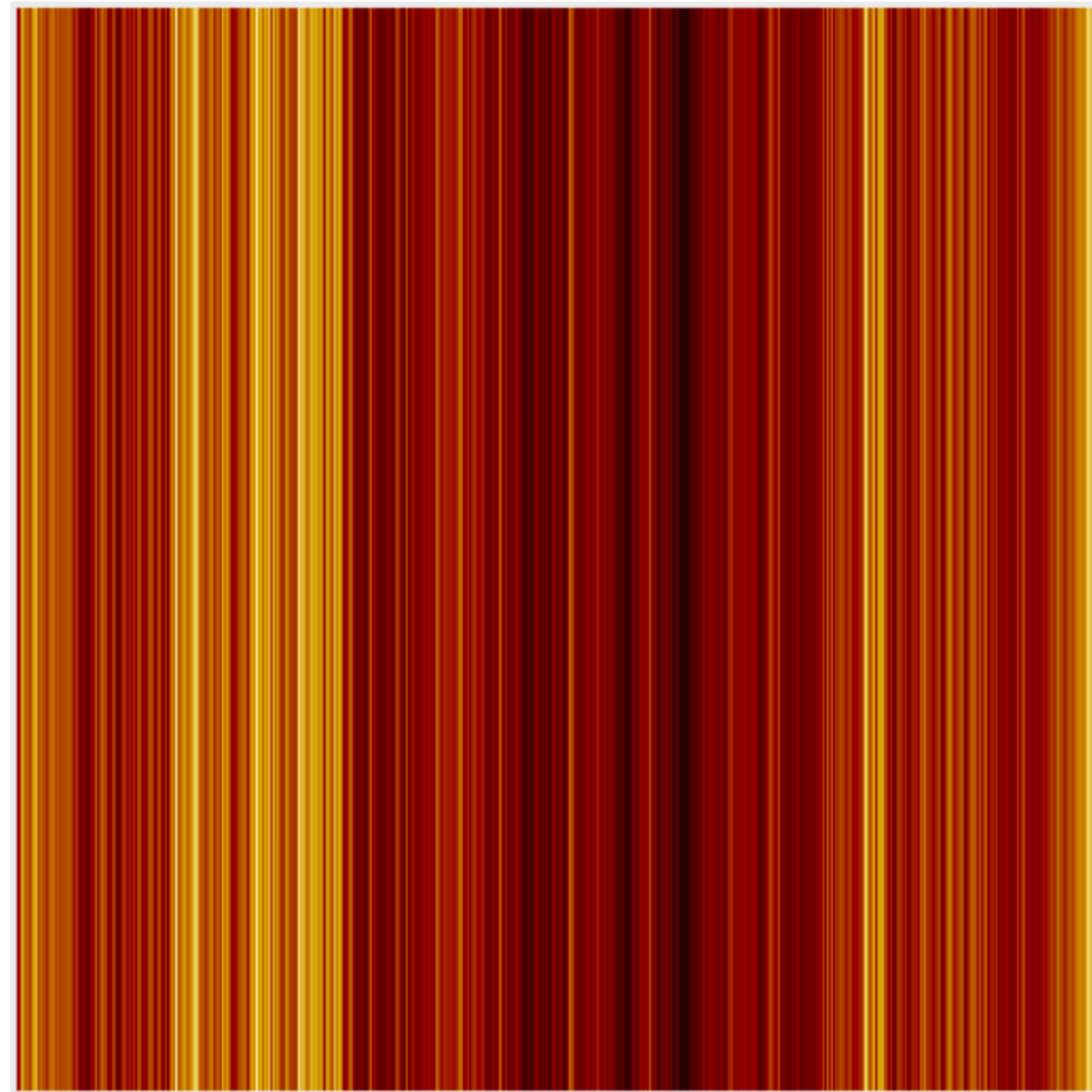
NSClean correction,
NRS2

NSClean mask

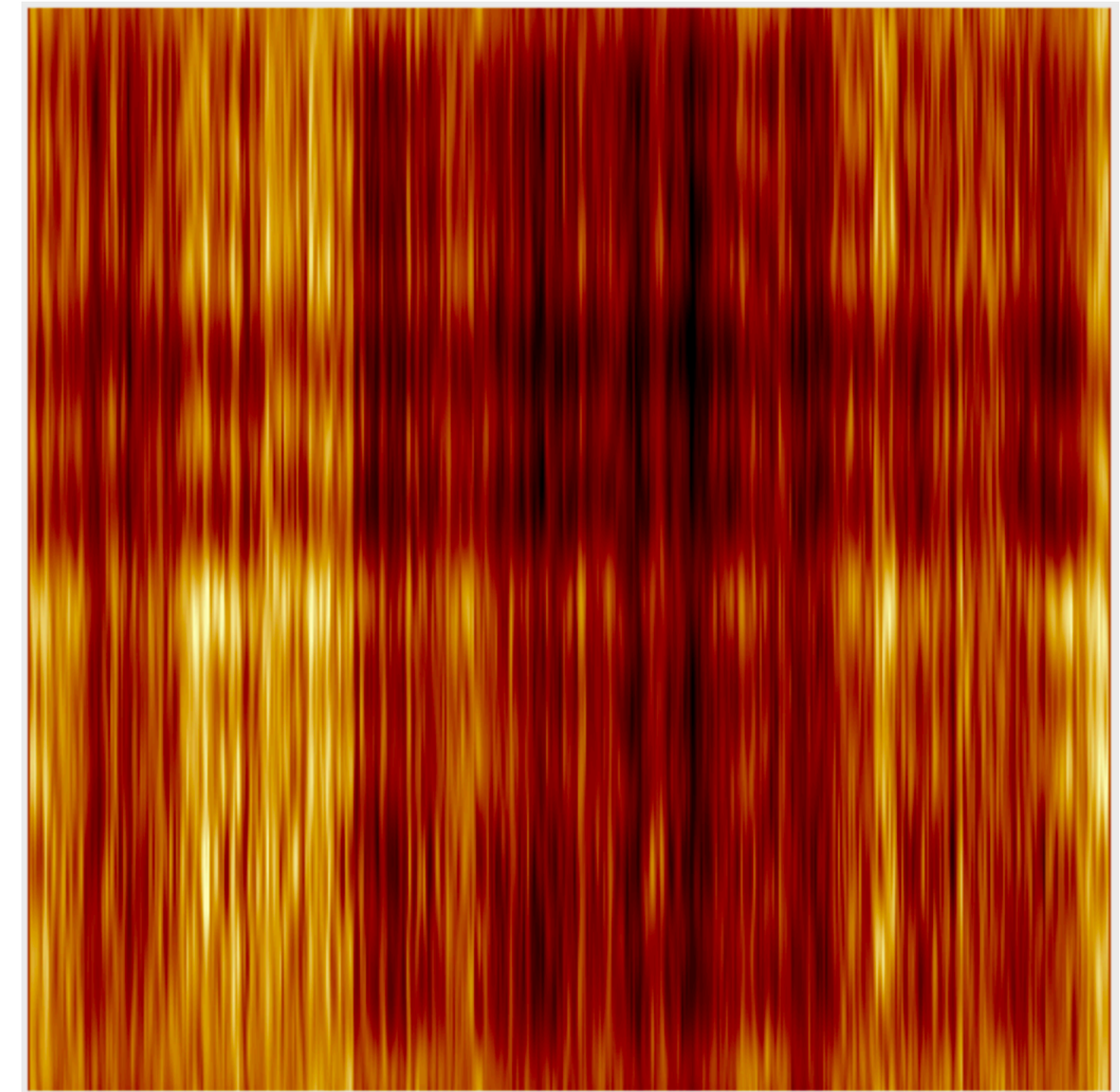


JWST/NIRSpec IFU – 1/f subtraction

Original IMAGE – 1/f-corrected IMAGE

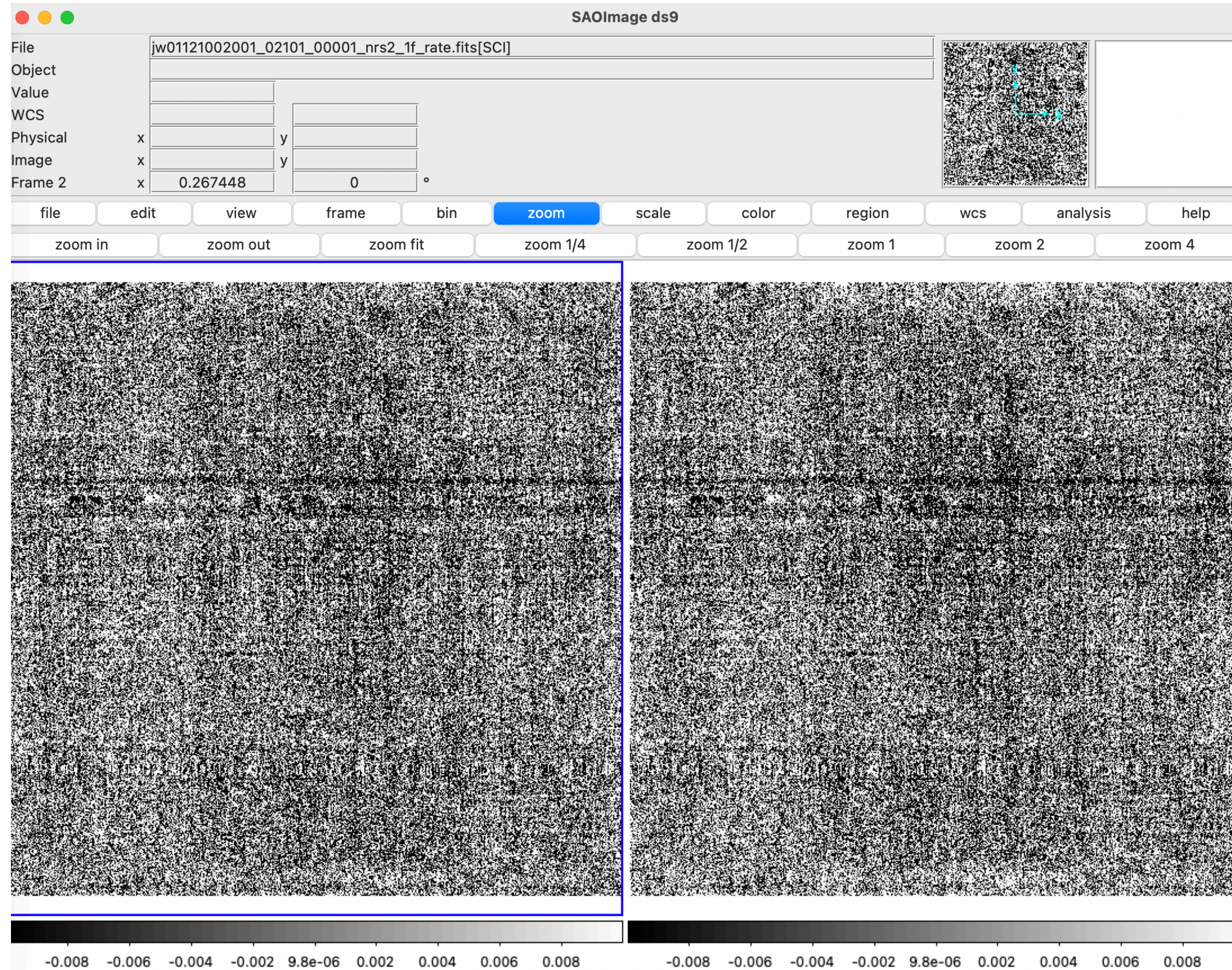


single_column correction



NSClean correction

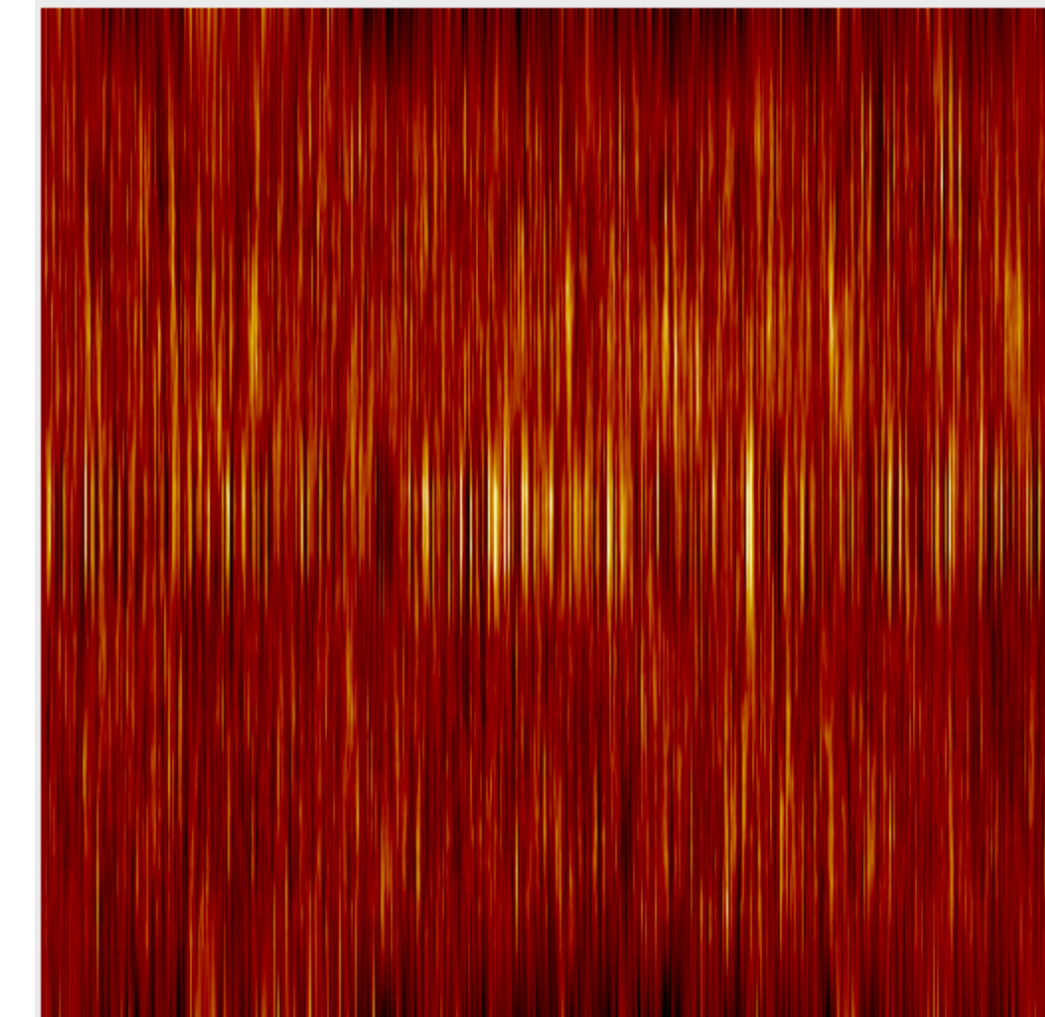
JWST/NIRSpec IFU – 1/f subtraction



single_column 1/f correction,
NRS2

single_column 1/f correction,
With same masks used for
NSClean

Difference



JWST/NIRSpec IFU – 1/f subtraction

pipeline v1.8.2 with CTX 1148.pmap

Input: XID2028 uncal files

jw01335004001_03101_00002_nrs1_uncal.fits

jw01335004001_03101_00002_nrs2_uncal.fits

STAGE1 default outputs

jw01335004001_03101_00002_nrs1_rate.fits

jw01335004001_03101_00002_nrs2_rate.fits

(After subtracting median DN/s)

single_column 1/f correction outputs

jw01335004001_03101_00002_nrs1_1f_rate.fits

jw01335004001_03101_00002_nrs2_1f_rate.fits

single_column 1/f correction with masks from NSClean

jw01335004001_03101_00002_nrs1_1fmasked_rate.fits

jw01335004001_03101_00002_nrs2_1fmasked_rate.fits

NSClean inputs

jw01335004001_03101_00002_nrs1_rate.fits

jw01335004001_03101_00002_nrs2_rate.fits

(Median DN/s = [0 0])

NSClean outputs

jw01335004001_03101_00002_nrs1_cln_rate.fits

jw01335004001_03101_00002_nrs1_cln_rate.fits

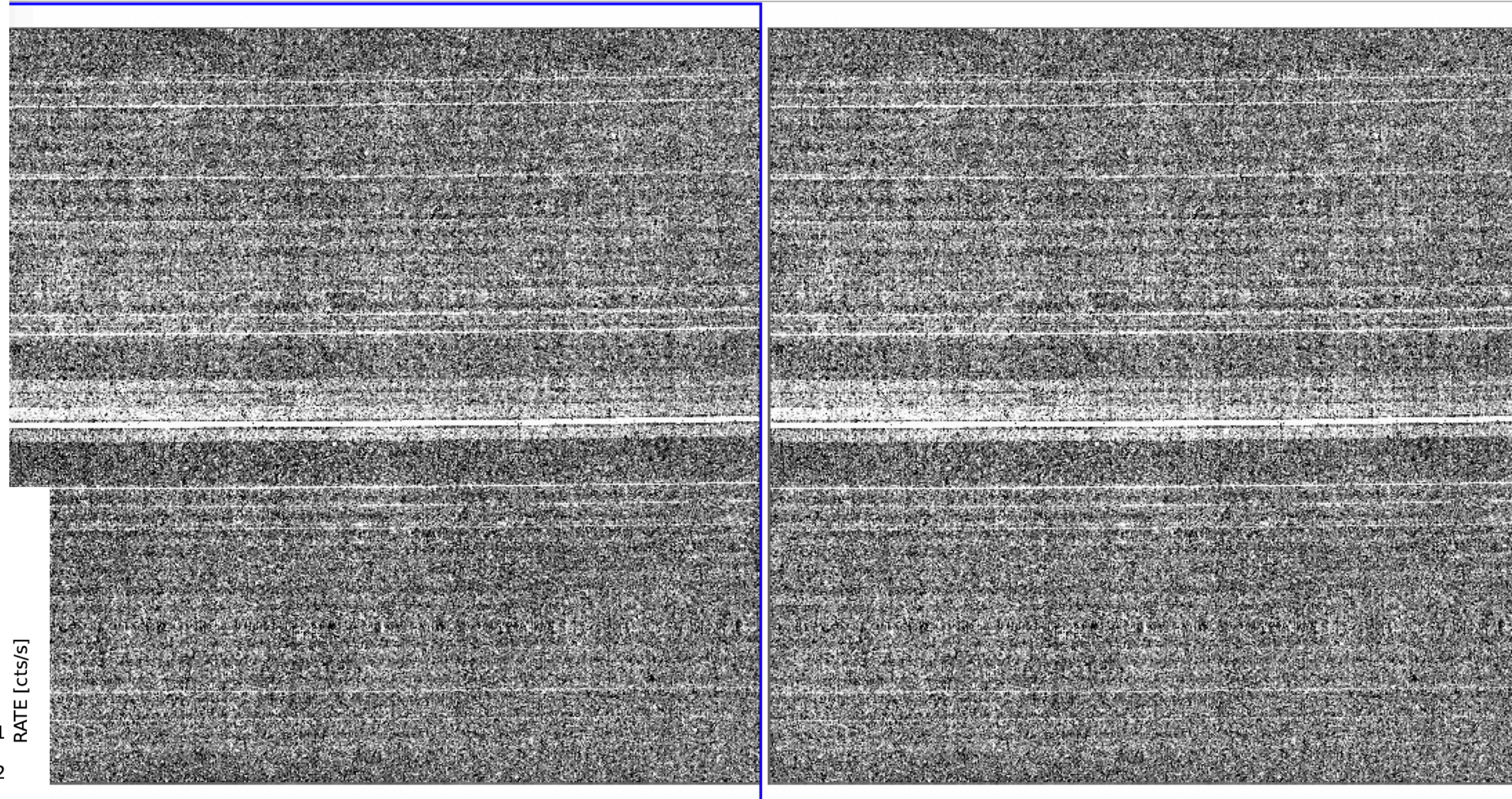
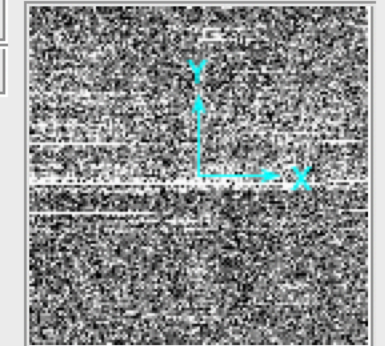
(After subtracting median DN/s)

JWST/NIRSpec IFU – 1/f subtraction

File: jw01335004001_03101_00002_nrs2_1f_rate.fits[SCI]
Object:
Value:
Physical x: y:
Image x: y:
Frame 5 x: 0.267448 y: 0 °

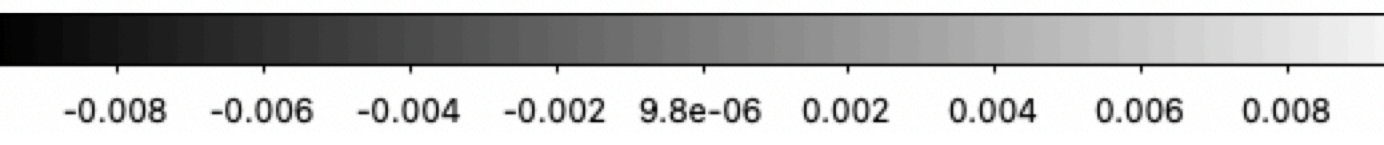
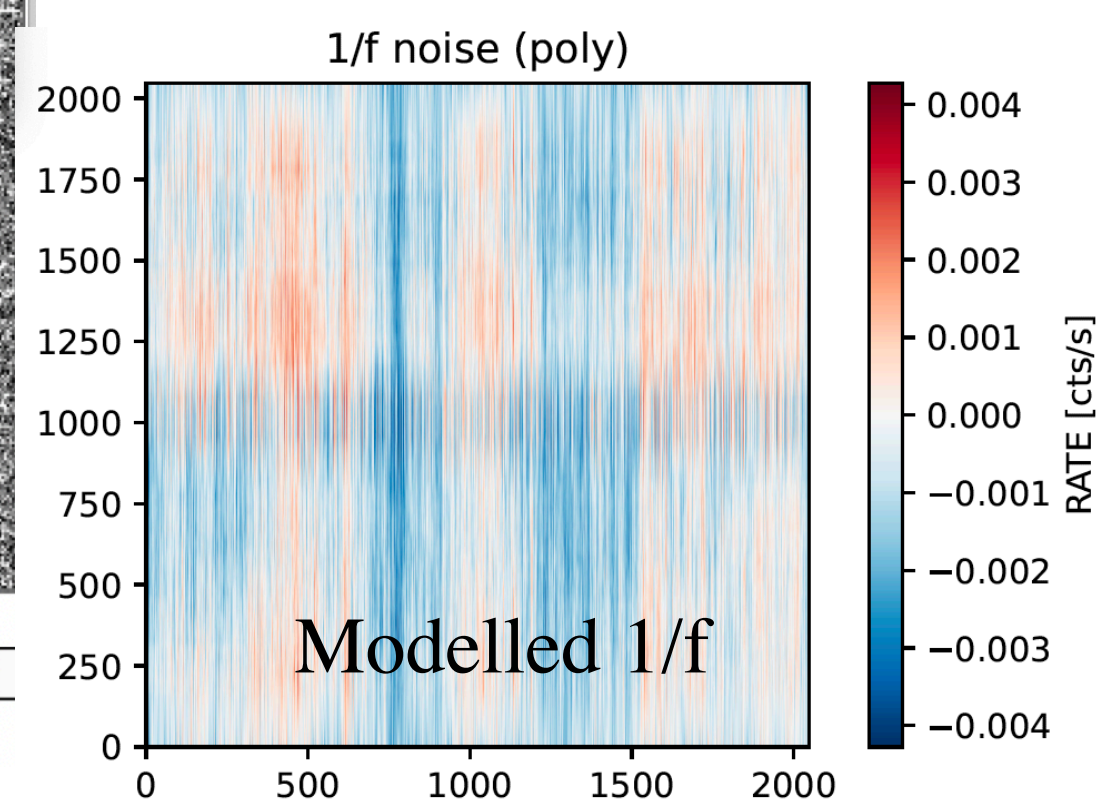
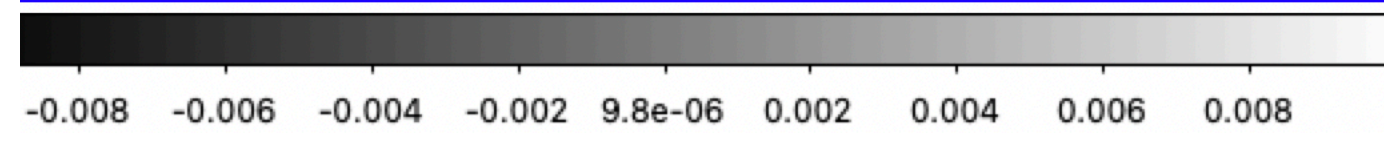
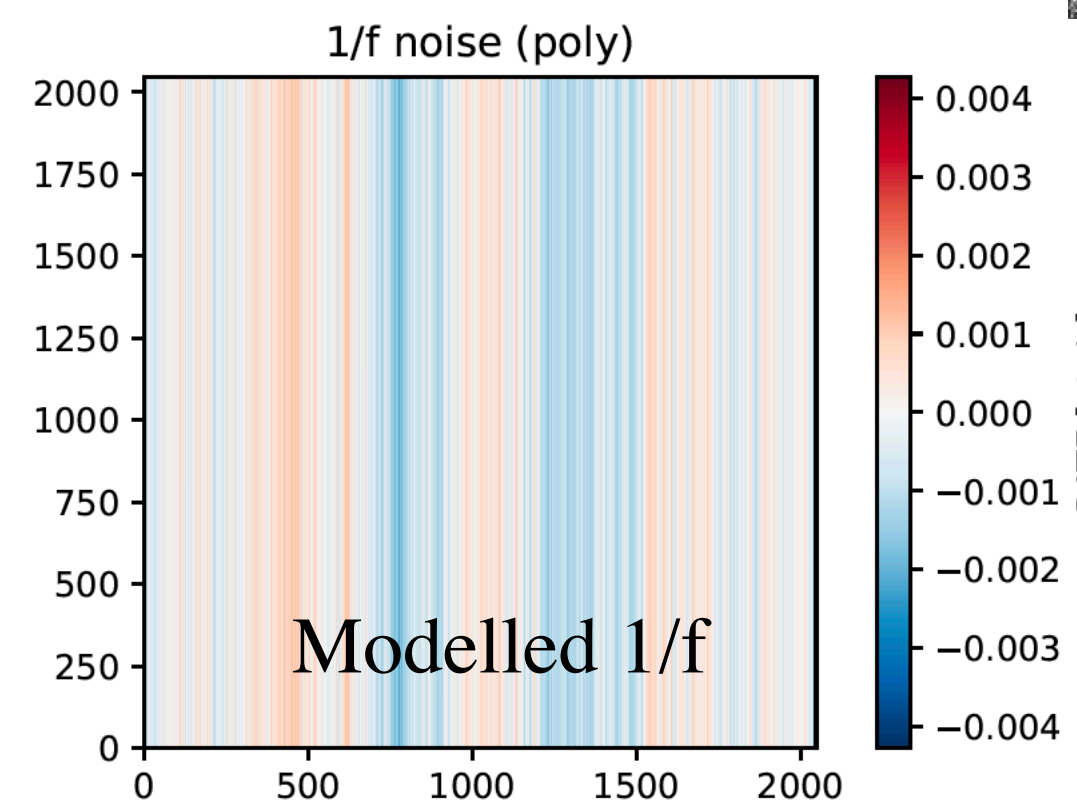
file edit view frame bin **zoom** scale color region wcs analysis help

zoom in zoom out zoom fit zoom 1/4 zoom 1/2 zoom 1 zoom 2 zoom 4

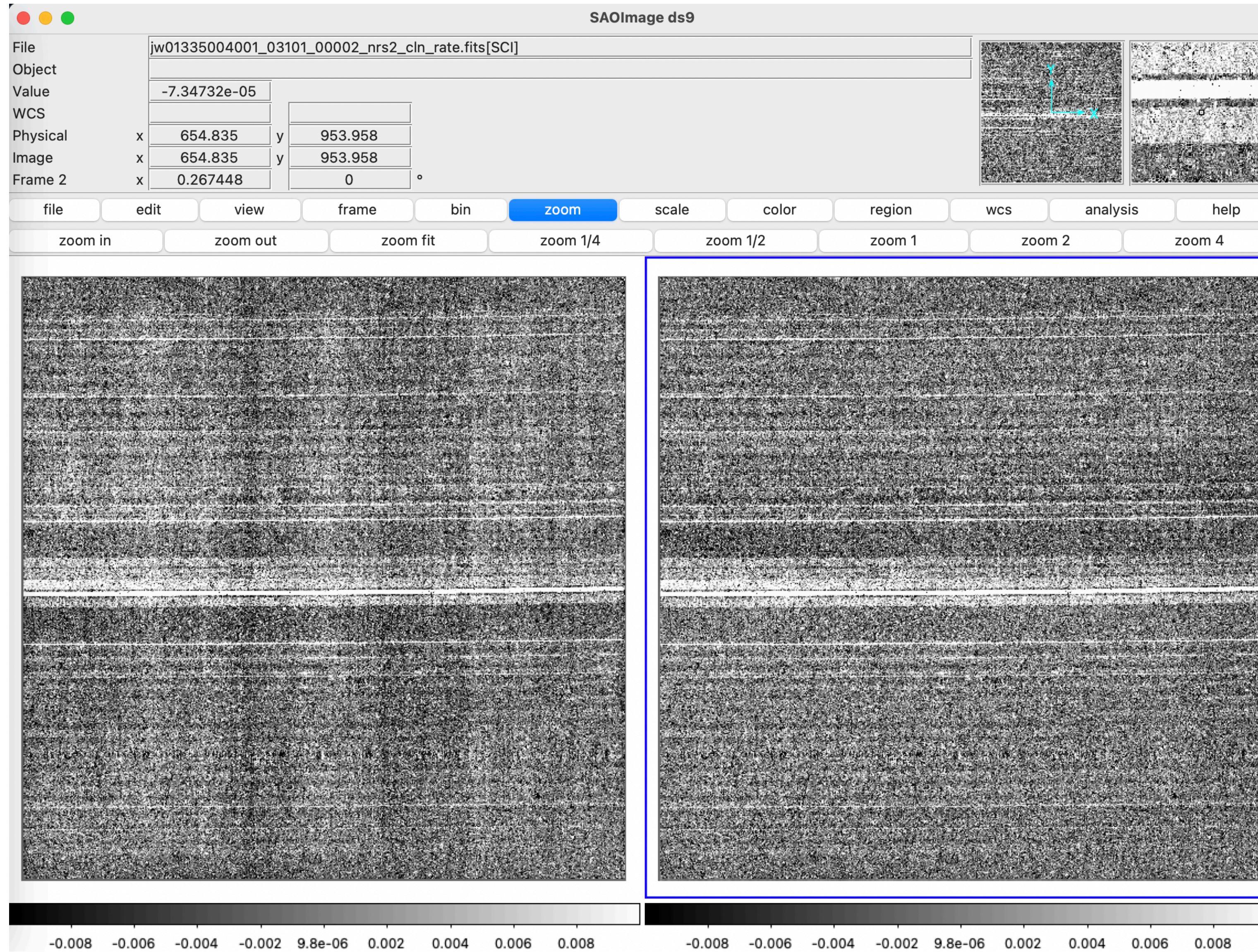


single_column 1/f correction,
NRS2

single_column 1/f correction,
with same **masks** used for
NSClean



JWST/NIRSpec IFU – 1/f subtraction

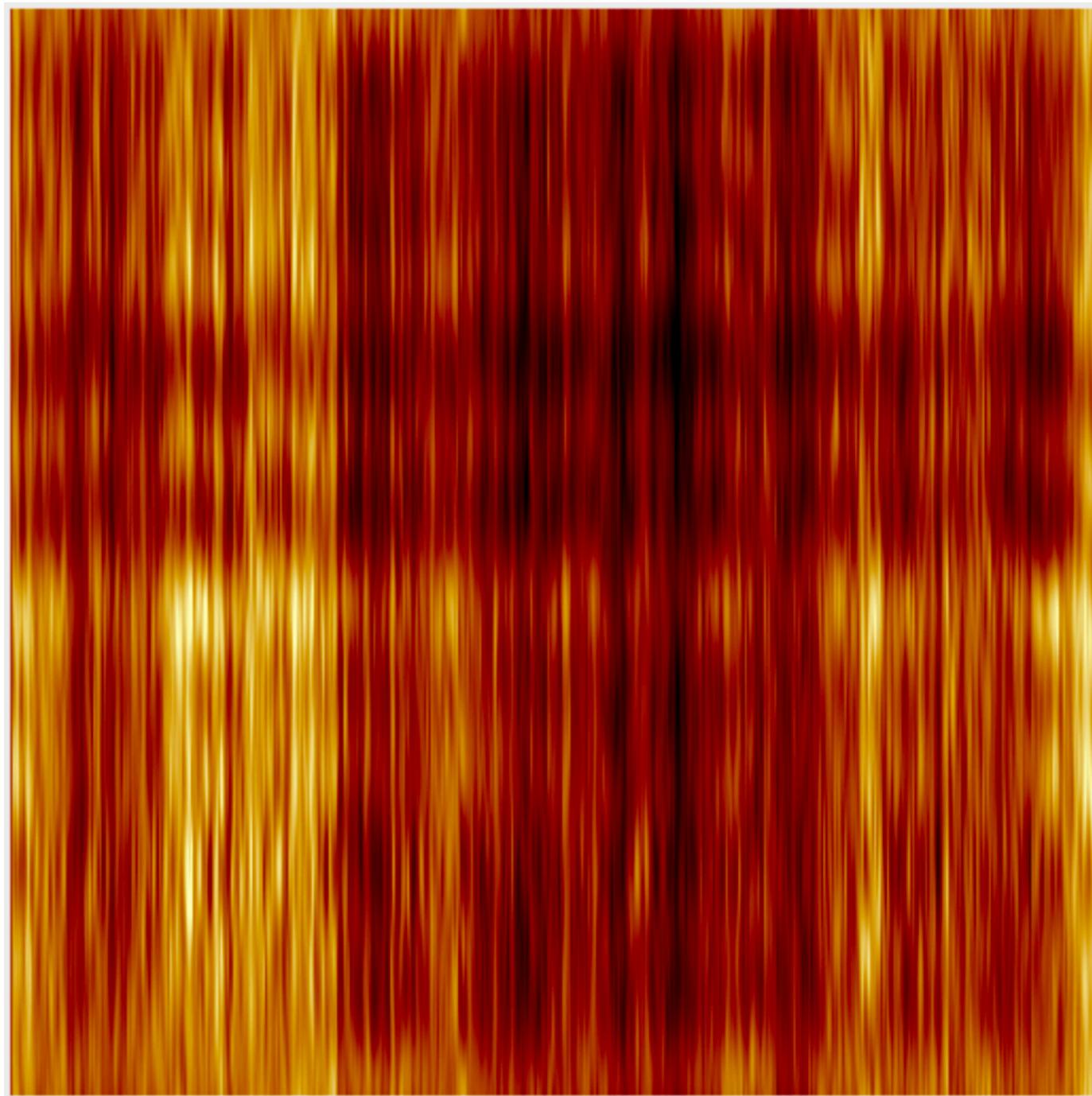


Comments

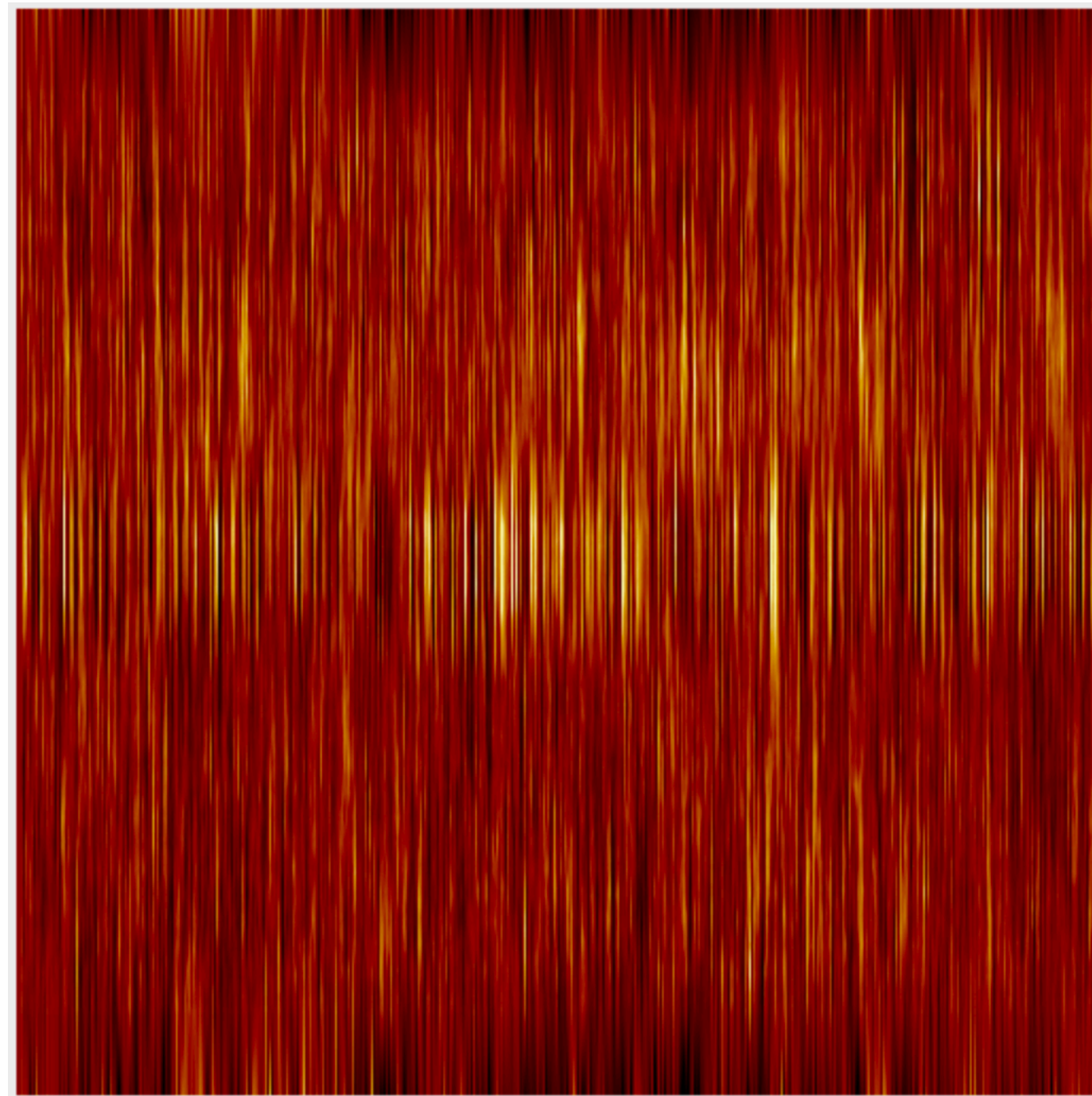
NSClean seems to work better than the single_column correction. Not sure if the NSClean modelled 1/f looks reasonable or not. It may introduce a spatial bias in the count rate images

The masked single_column correction provides modelled 1/f structures more similar to those of NSClean.

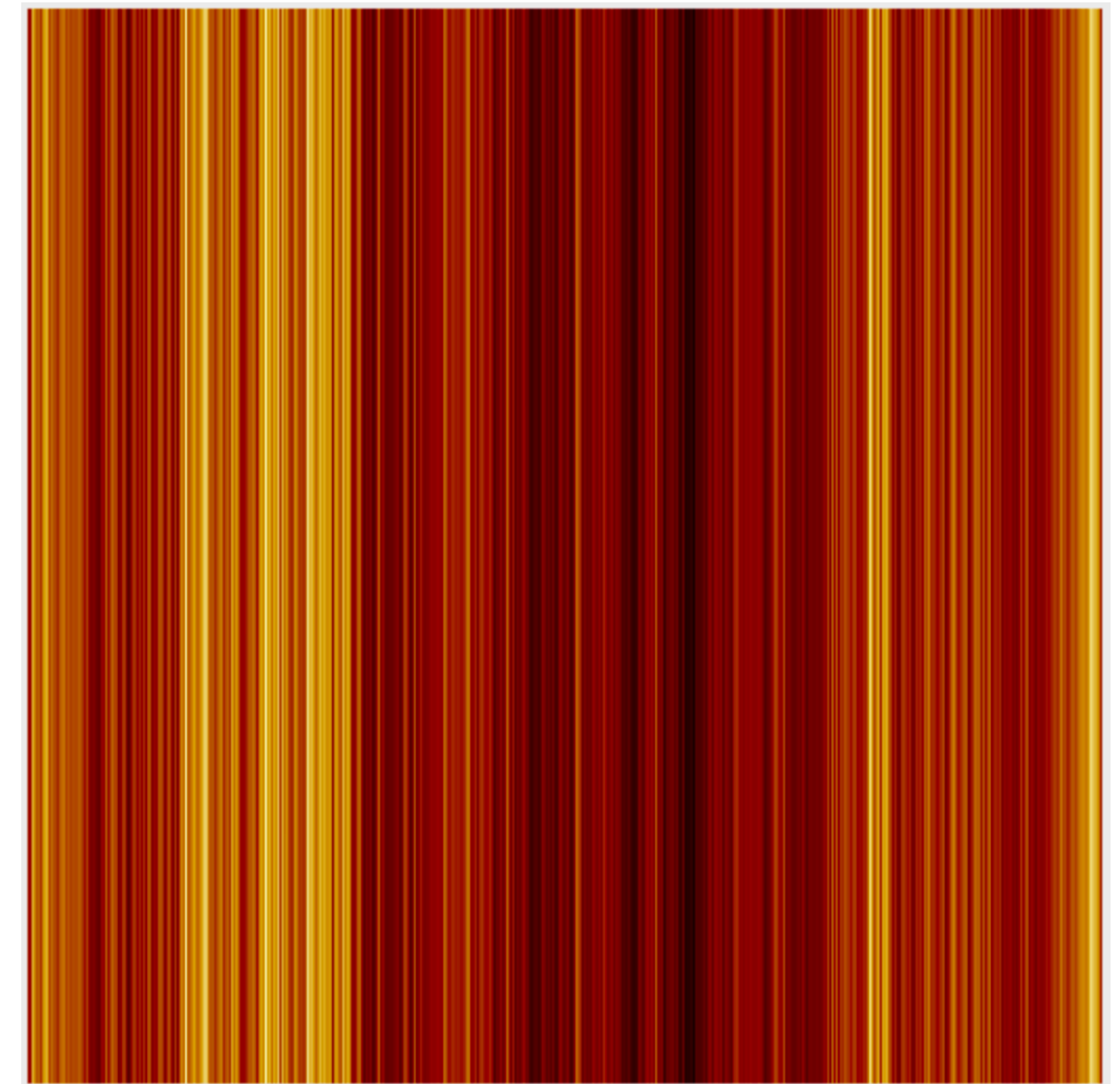
Count rate images in https://drive.google.com/drive/folders/1-2so2-IyRrv.JocEnO3LSNd-s.J6A55t6W?usp=drive_link



NSClean correction



Masked single_col correction



single_col correction