# Good News for MOS, MXU & Co

## The new spectroscopic pipeline for the FORSes

Sabine Moehler

# *Overview*

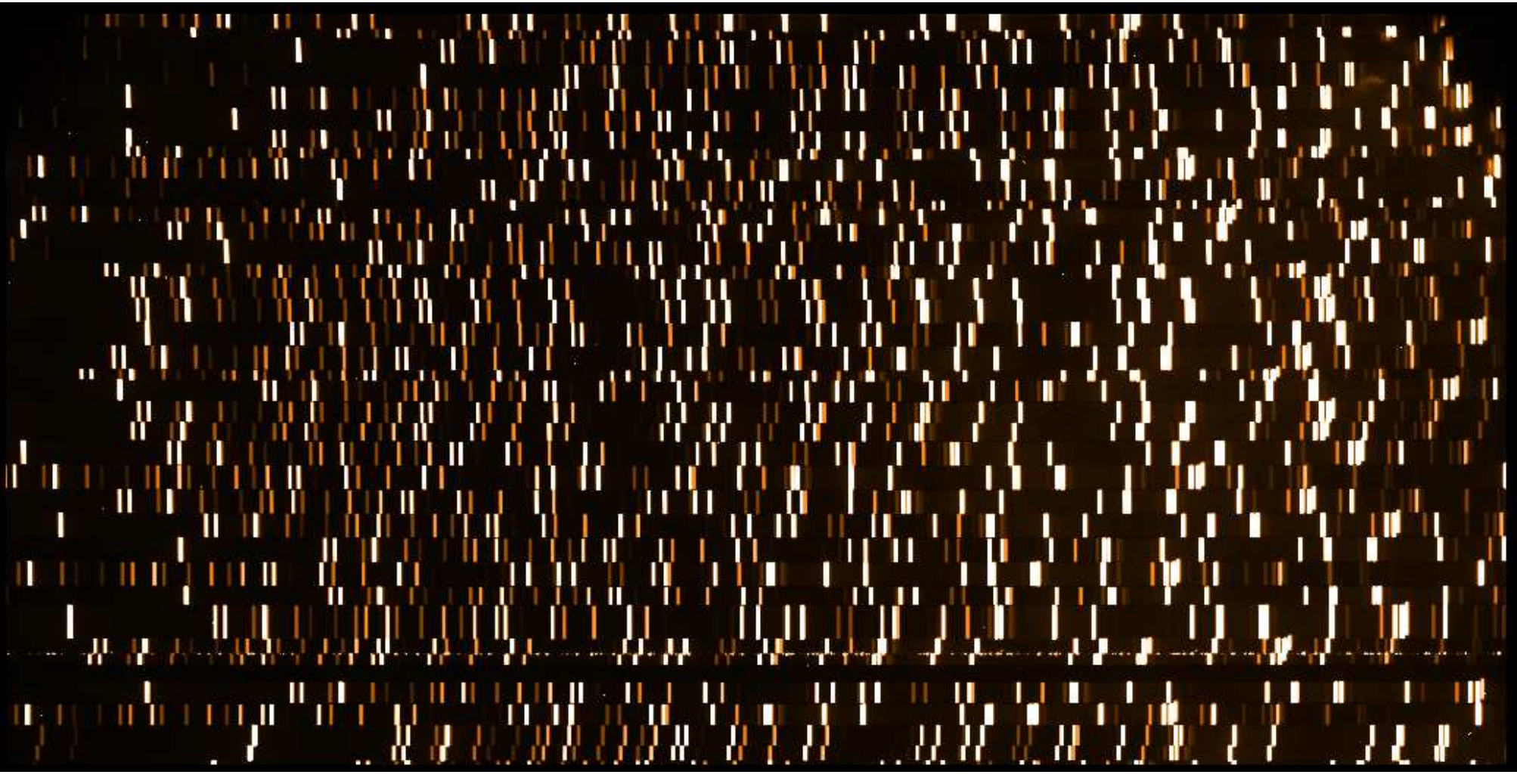
- How does the new pipeline work?
- Strengths and Weaknesses
- Quality Control

# *How does the new pipeline work?*

(see also talk by Carlo Izzo)

- ⋆ spectra detection on arc lamp frame

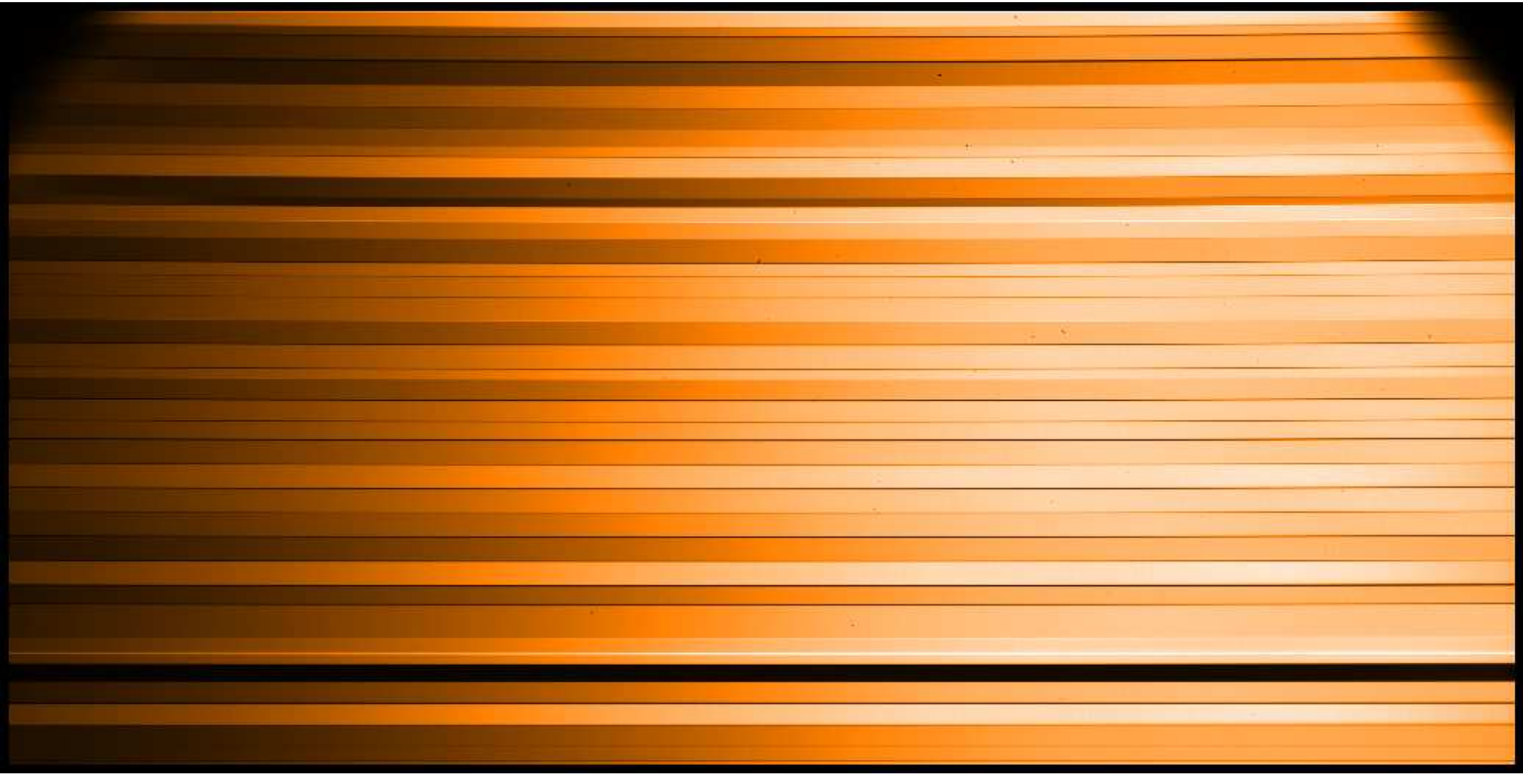
# *Raw Arc Frame*



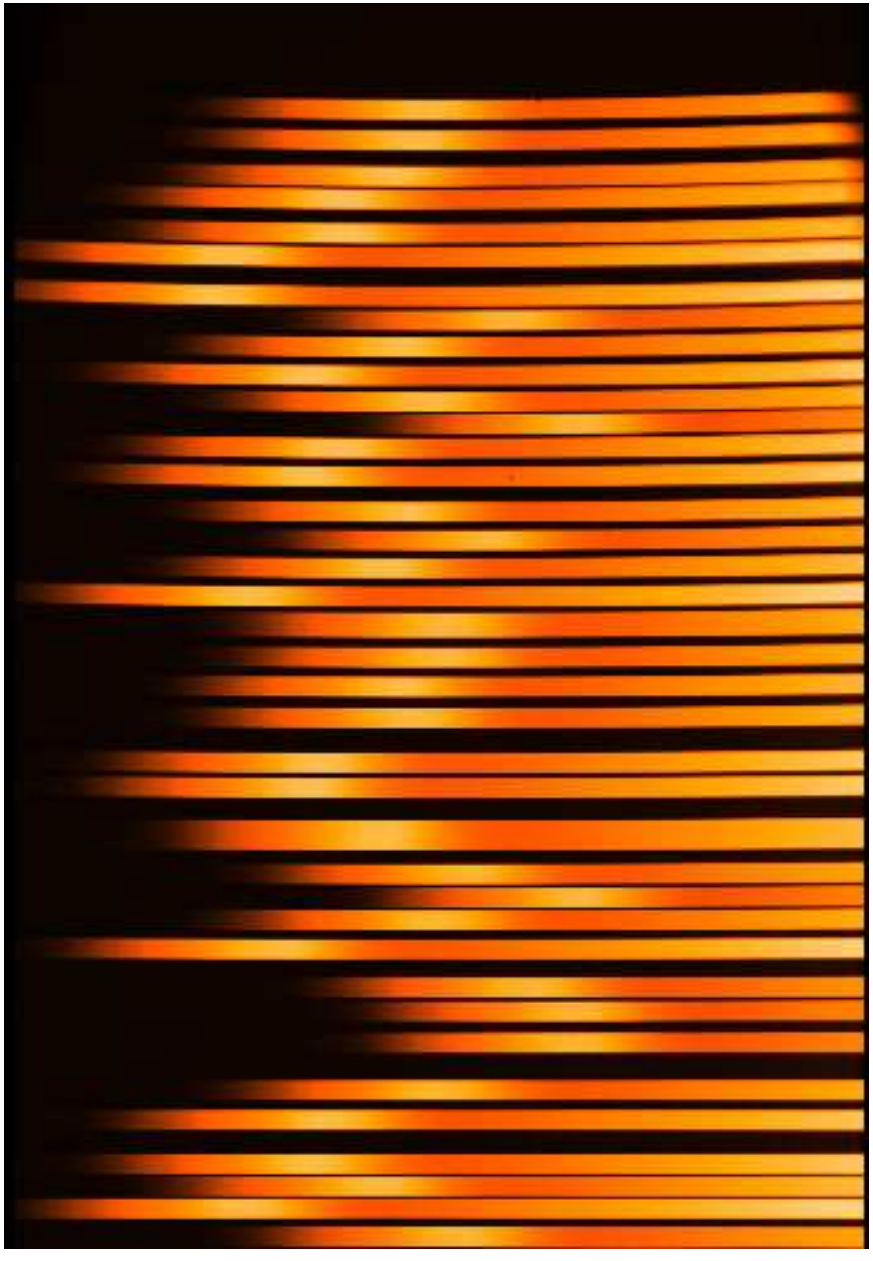
# *How does the new pipeline work?*

- ⋆ spectra detection on arc lamp frame
- ⋆ spatial curvature from flat field frame

# *Raw Flat Field Frame*



# *Raw Flat Field Frame*



# *How does the new pipeline work?*

- ⋆ spectra detection on arc lamp frame
- ⋆ spatial curvature from flat field frame
- ⋆ line identification and spectral curvature from arc lamp frame

# *How does the new pipeline work?*

Tables with

- slit position
- dispersion coefficients
- spatial curvature coefficients
- global distortion coefficients (if number of slitlets sufficient)

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Master frames

- ⋆ bias
- ⋆ flat field (normalized and not-normalized)

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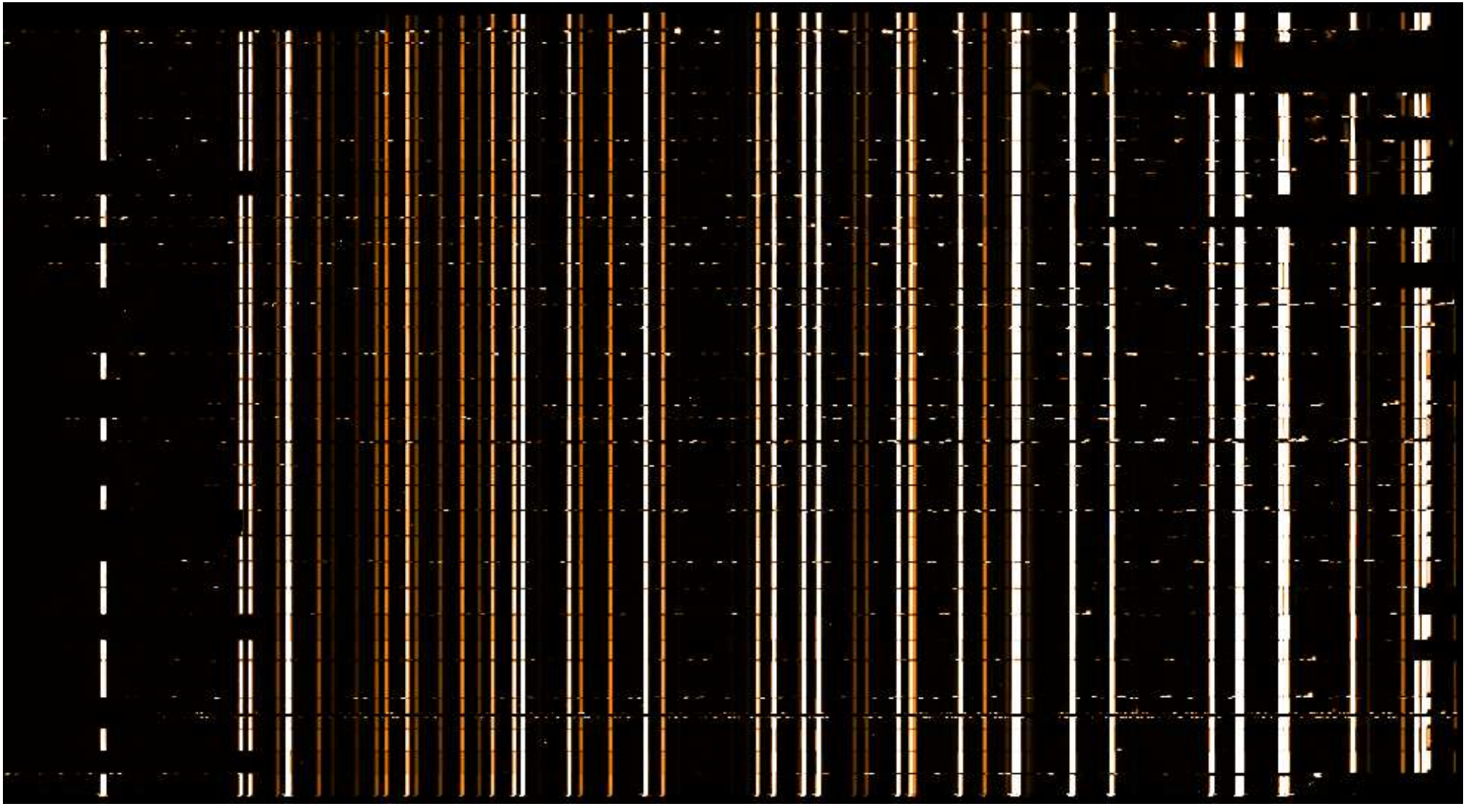
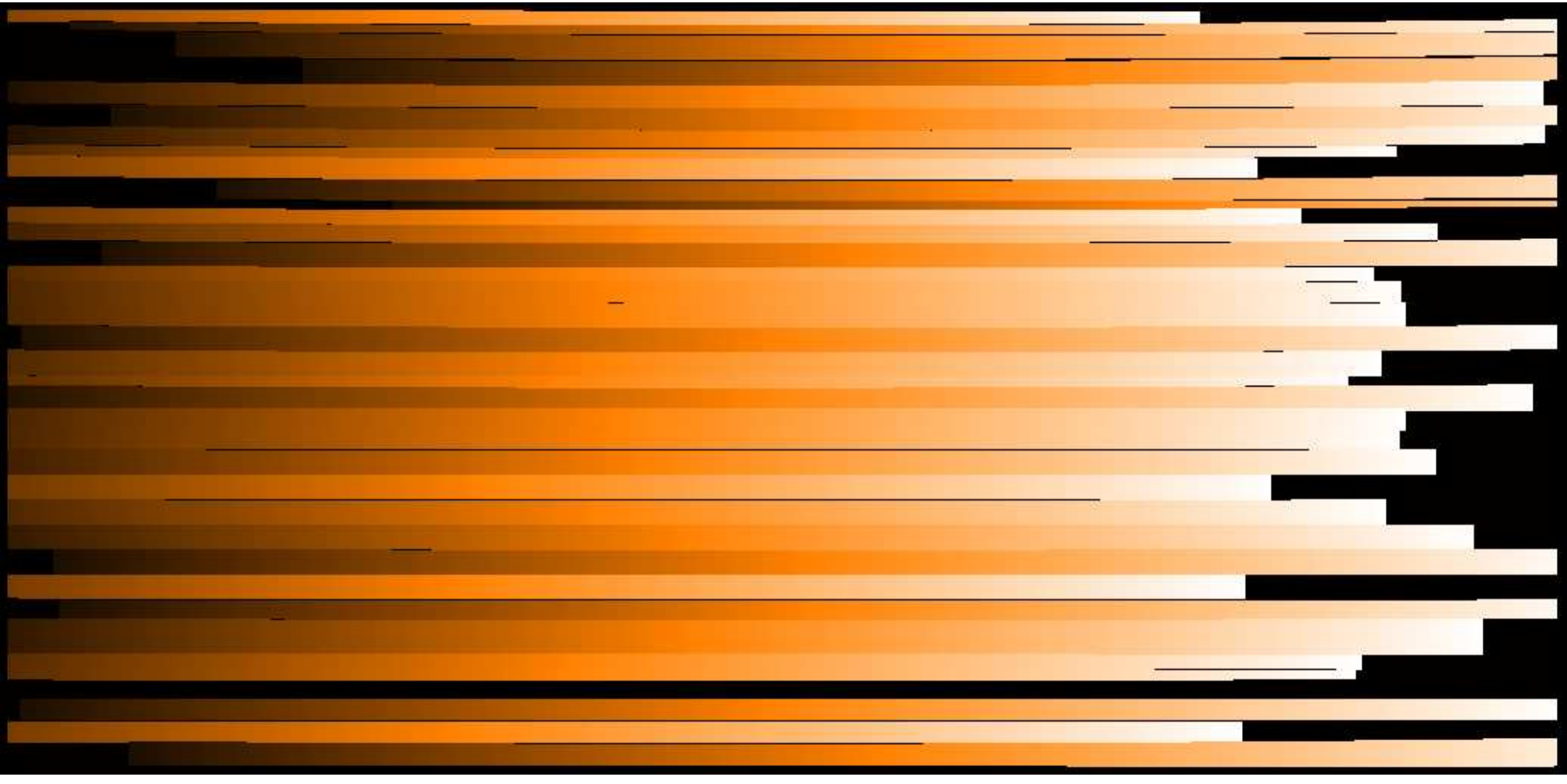
Product Frames

- ⋆ spatial map
- ⋆ wavelength map
- ⋆ reduced arc lamp

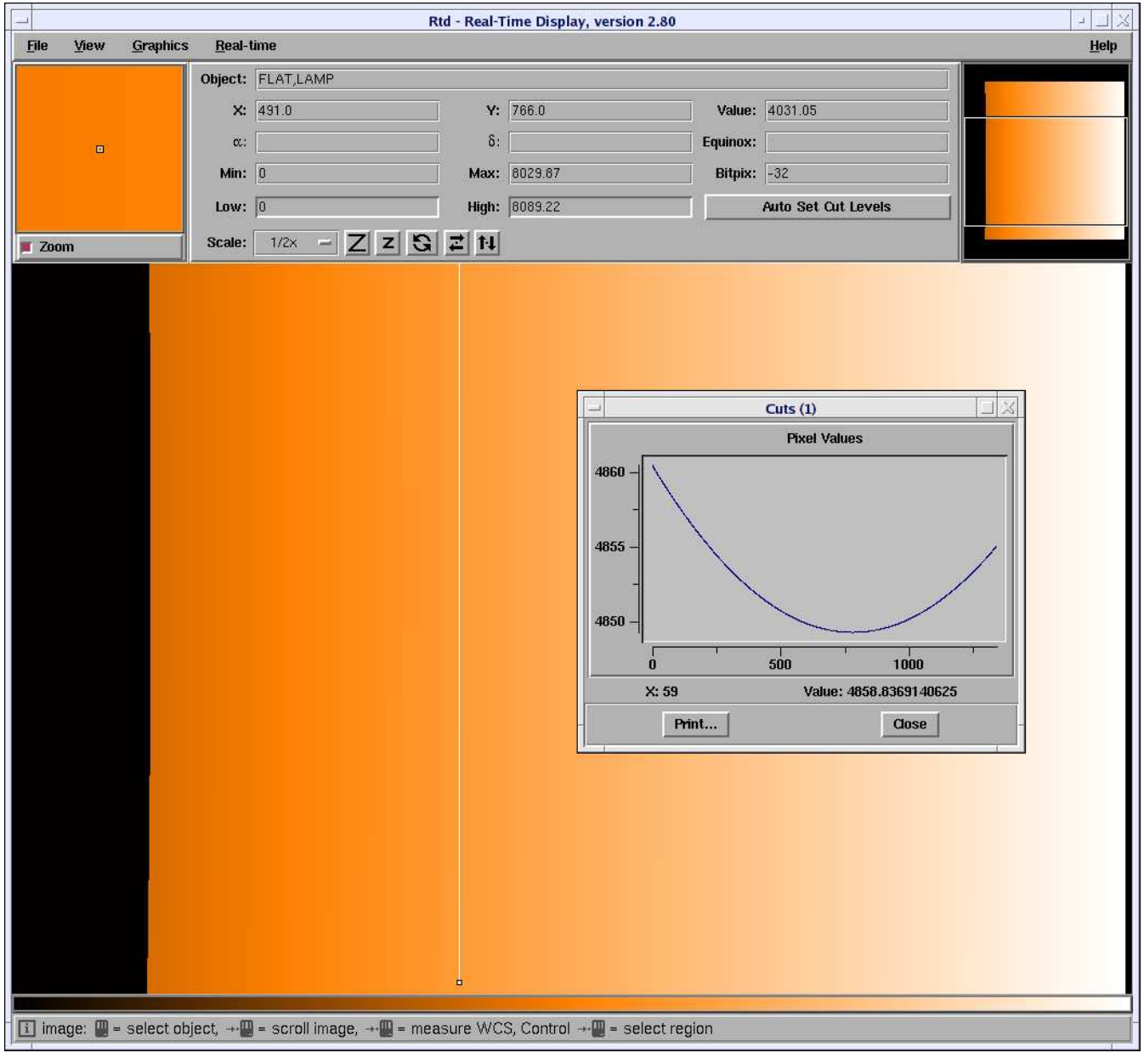
# *Reduced Arc Frame*



# *Wavelength Map (MXU)*



# Wavelength Map (LSS)



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- ⋆ polynomial degrees for spectral and spatial curvature fits

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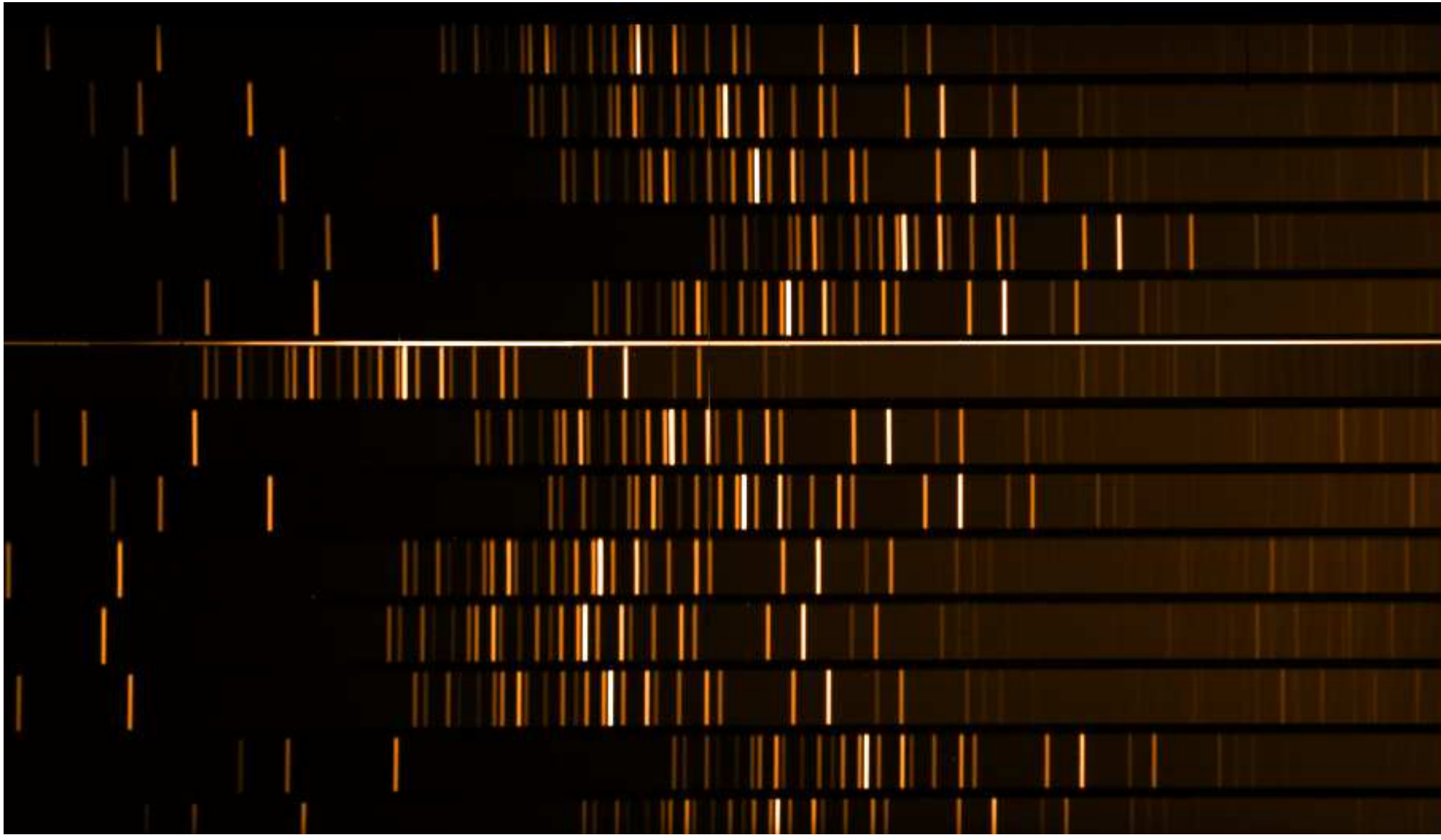
- ⋆ wavelength range of interest
- ⋆ peak detection threshold
- ⋆ line catalog
- ⋆ polynomial degrees for spectral and spatial curvature fits

no first guess needed

# HET LRS data



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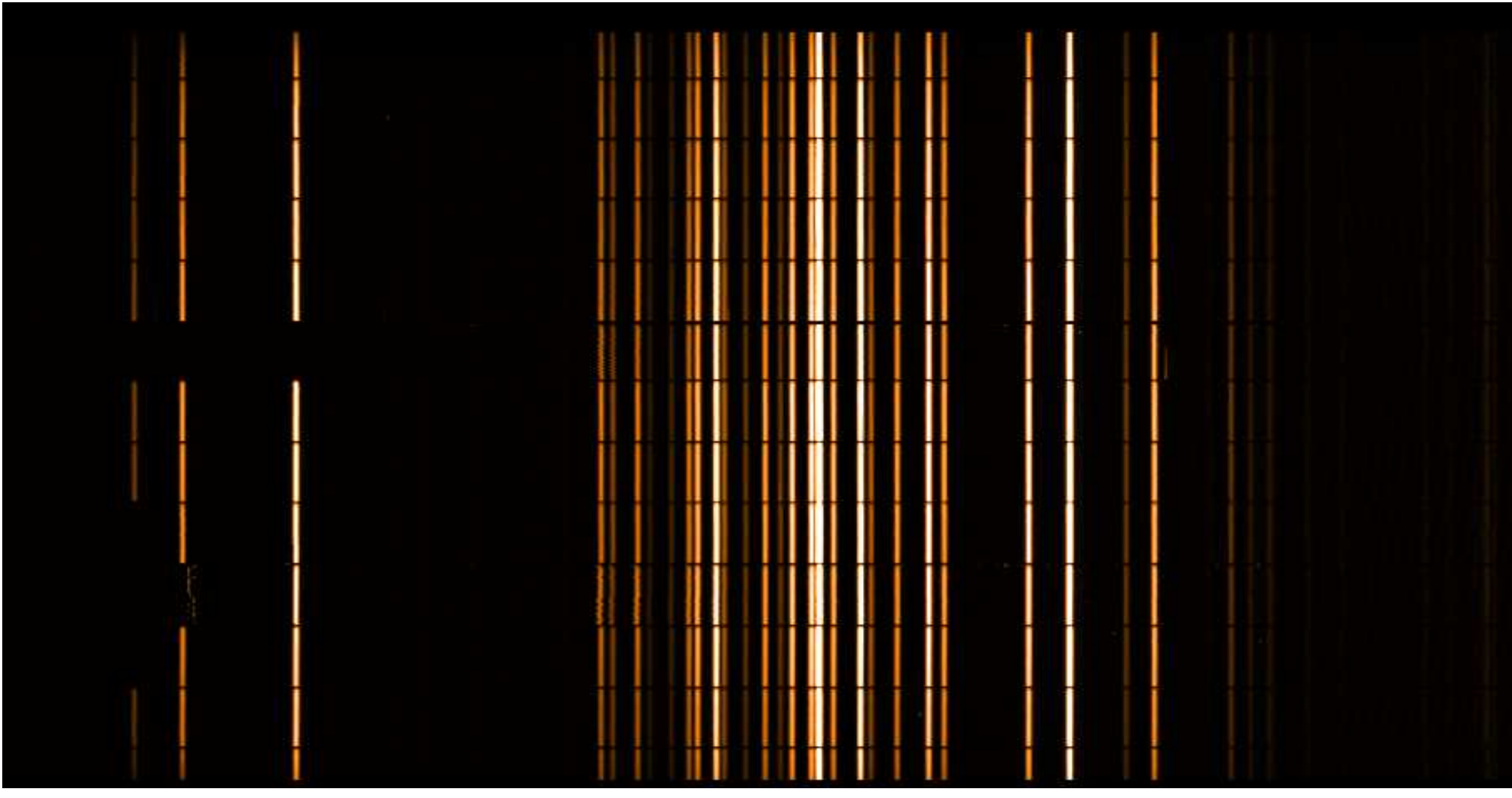

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- ⋆ all FORS grisms

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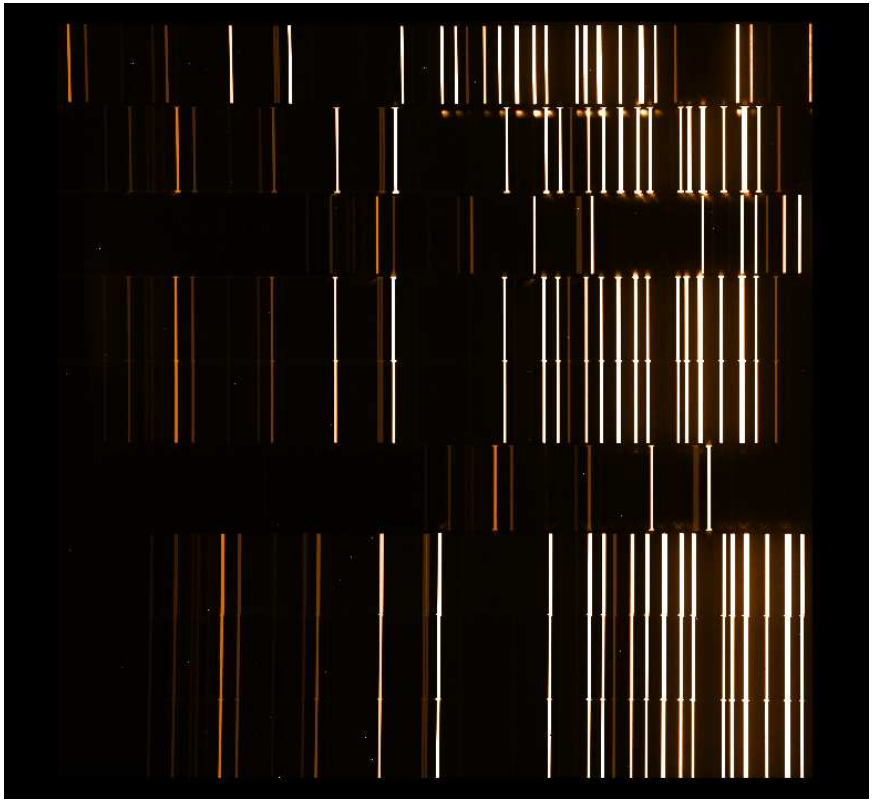
. . . in automatic mode!

# *. . . and Weaknesses*

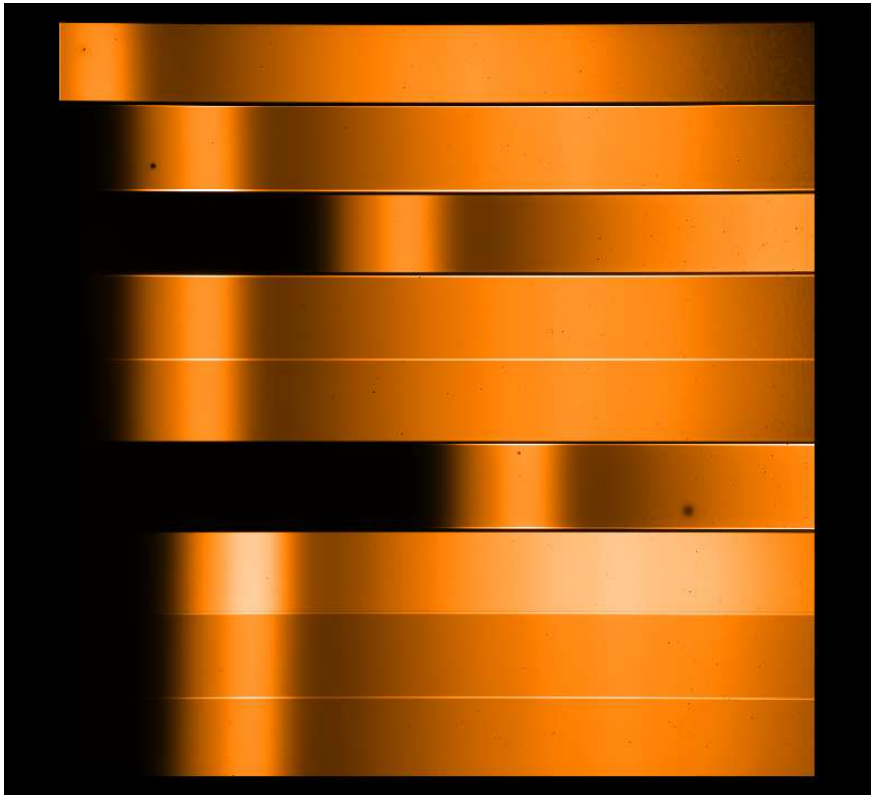
Pipeline has problems with data showing

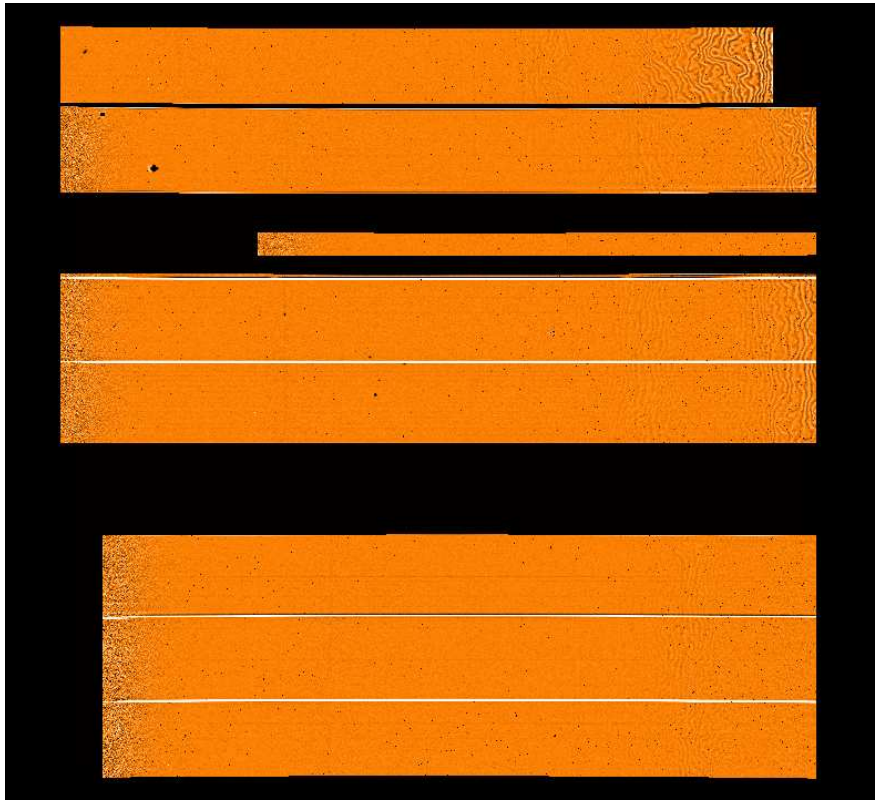
- ⋆ too few arc lines

# Raw and Reduced Arc Frame



# Averaged and Normalized Flat Field





# . . . and Weaknesses

Pipeline has problems with data showing

- ⋆ too few arc lines
- ⋆ regularly spaced arc lines
- ⋆ large gaps between arc lines
- ⋆ curved/slanted slits (in automatic mode)

# *Quality Control*

- check quality of calibration data, e.g.
  - residuals after wavelength calibration
  - artefacts in normalized flat fields

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- check quality of calibration data, e.g.
  - residuals after wavelength calibration
  - artefacts in normalized flat fields
- monitor instrument health, e.g.
  - central wavelength
  - resolution

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Currently trended parameters (for selected grisms)

- average resolution
- dispersion

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- average resolution
- dispersion

New parameters

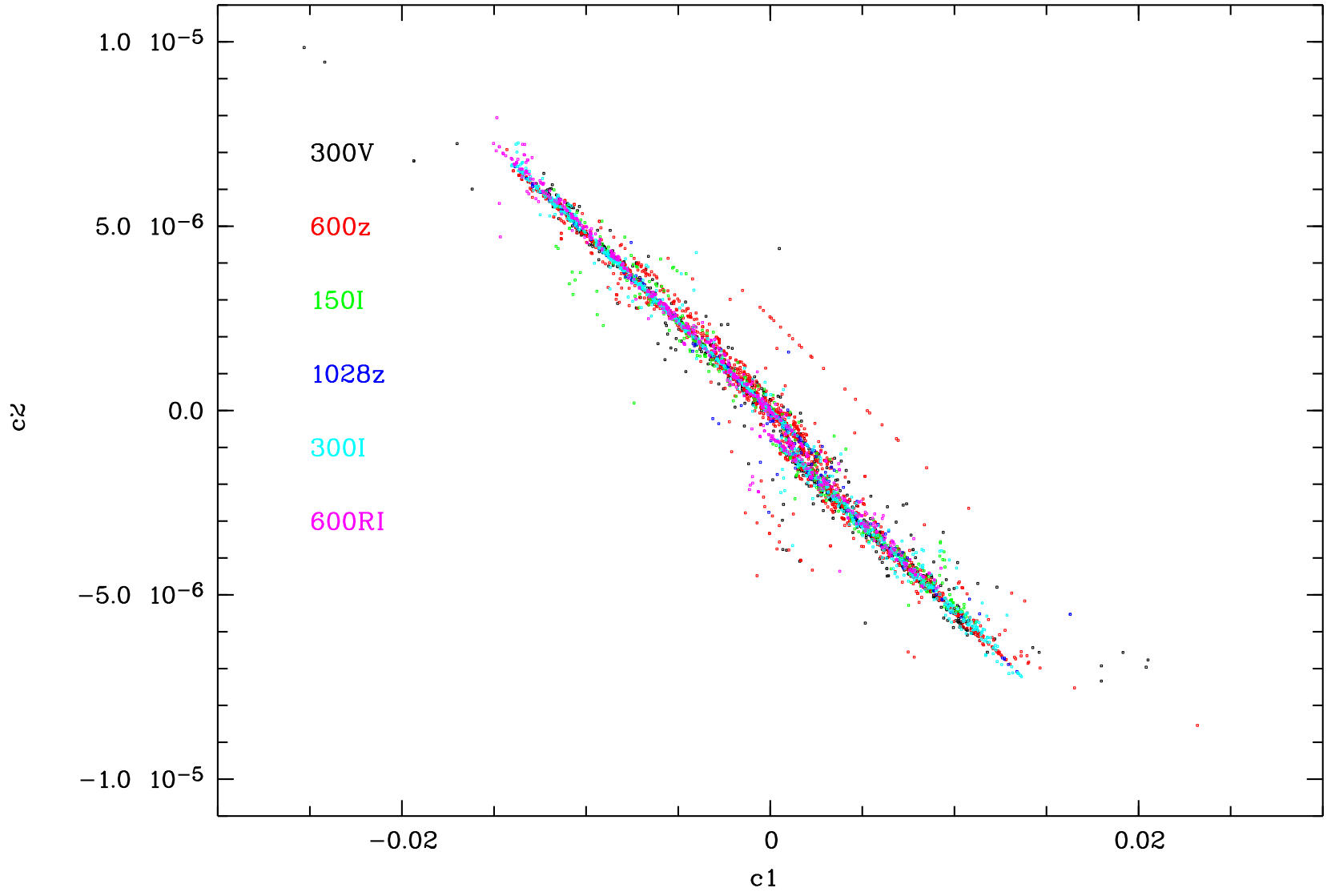
- number of independent wavelengths used for resolution
  = number of independent lines used for wavelength calibration
- rms of central resolution

# *Quality Control*

Additional possibilities

- ⋆ zeropoint of spatial curvature coefficients

# Spatial Curvature Coefficients



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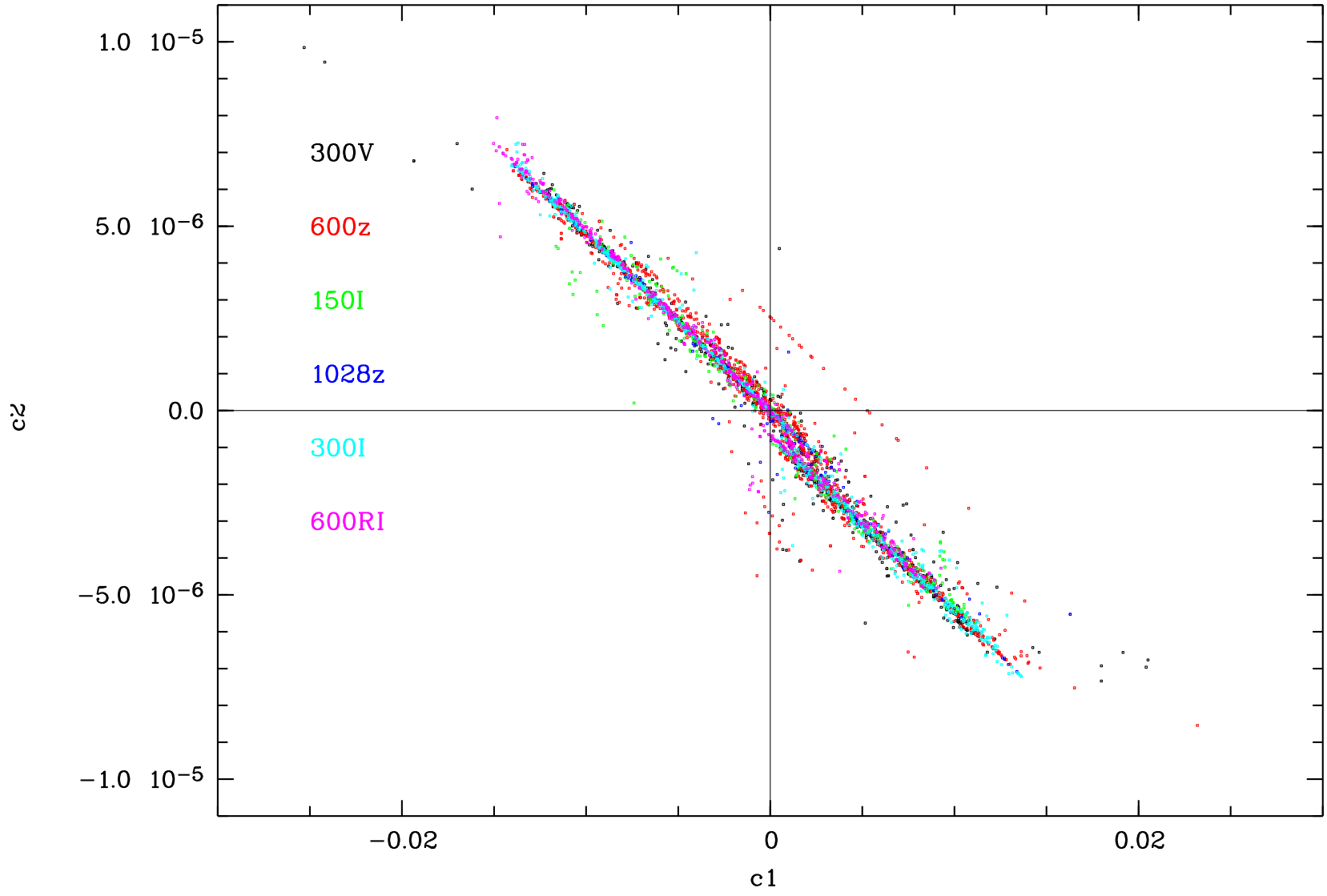
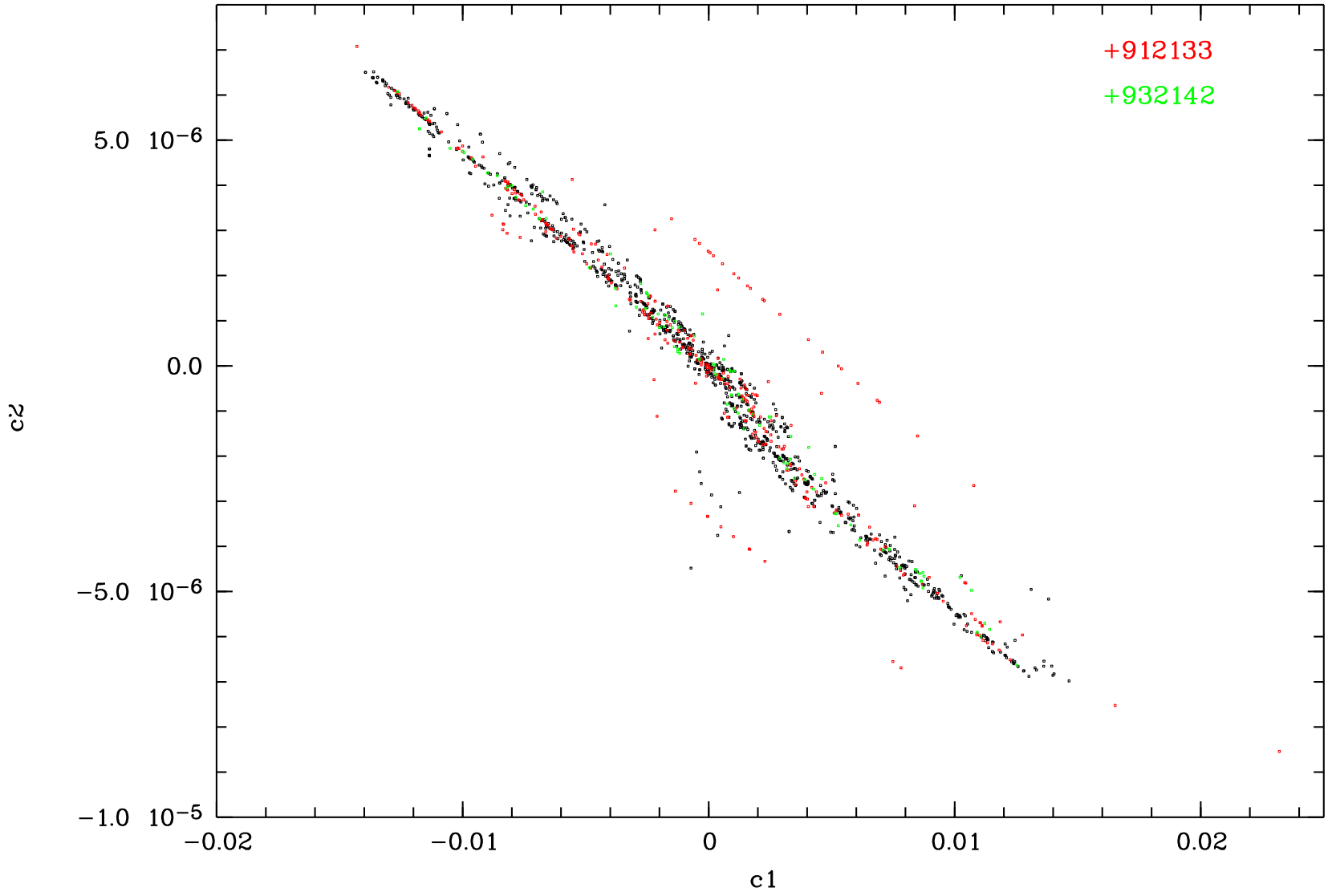
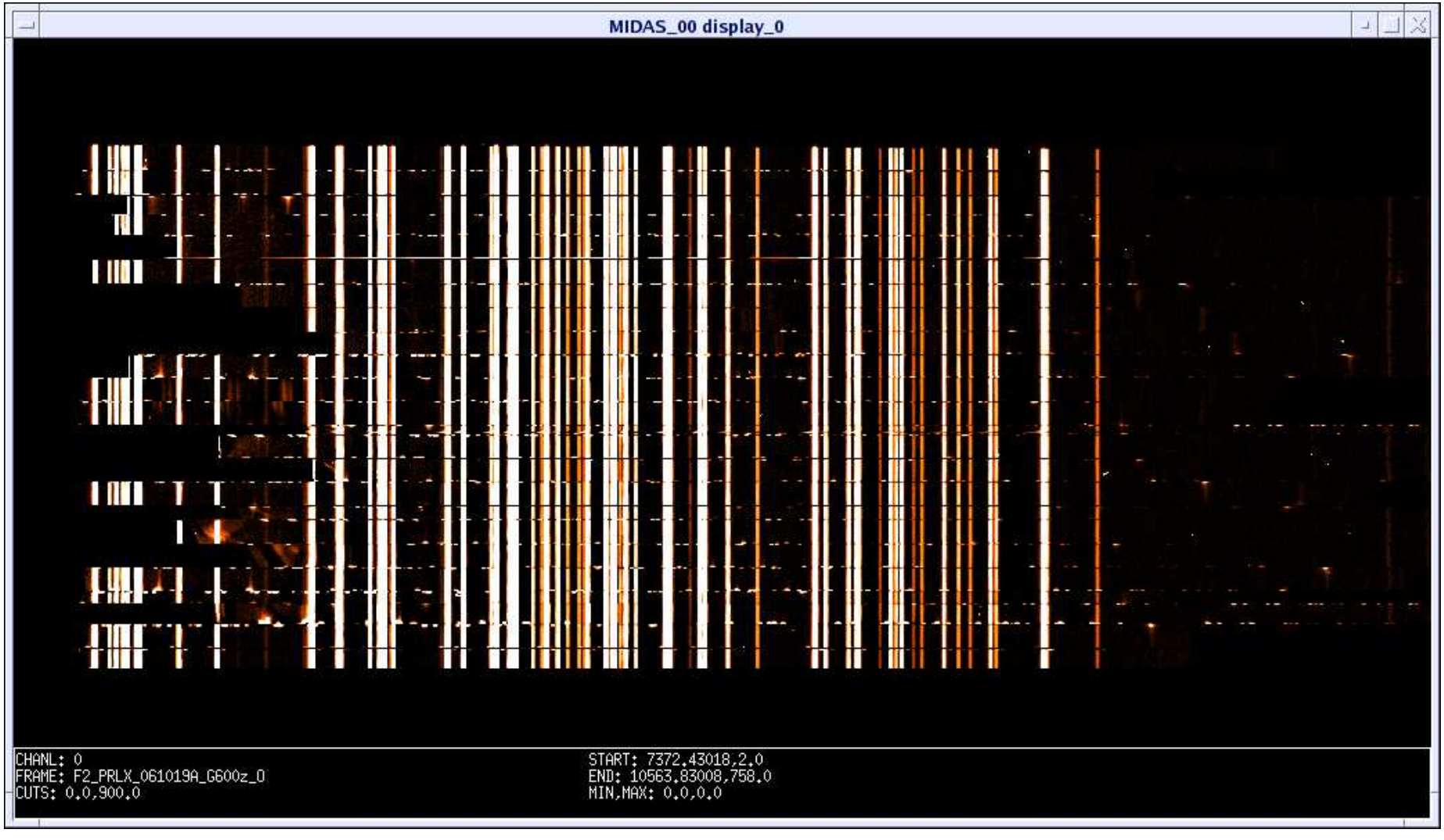


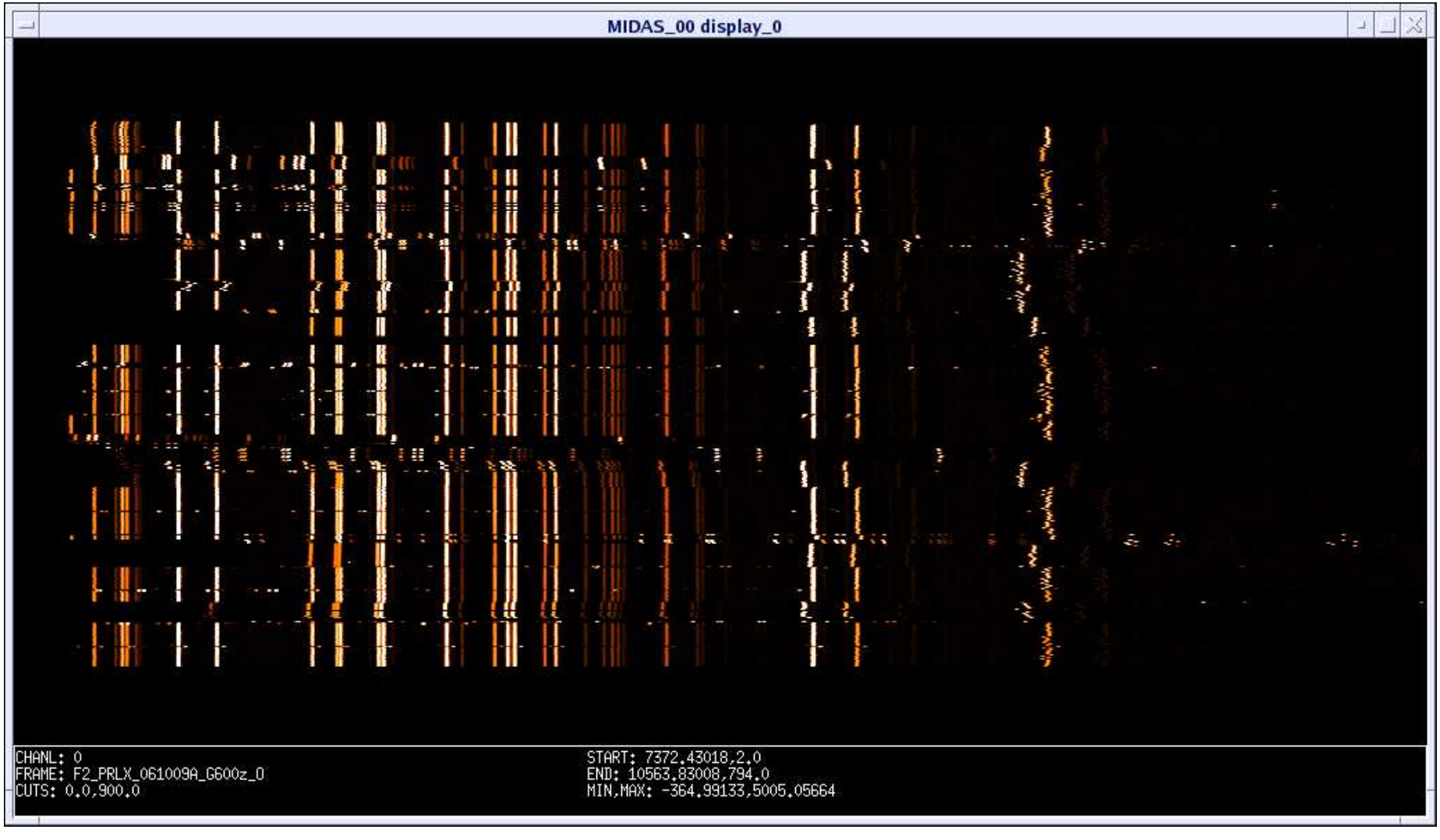
# Bad Spatial Curvature Coefficients



# Mask 932142


MIDAS_00 display_0
CHANL: 0
FRAME: F2_PRLX_061019A_G600z_0
CUTS: 0.0,900.0
START: 7372.43018,2.0
END: 10563.83008,758.0
MIN,MAX: 0.0,0.0

# Mask 912133

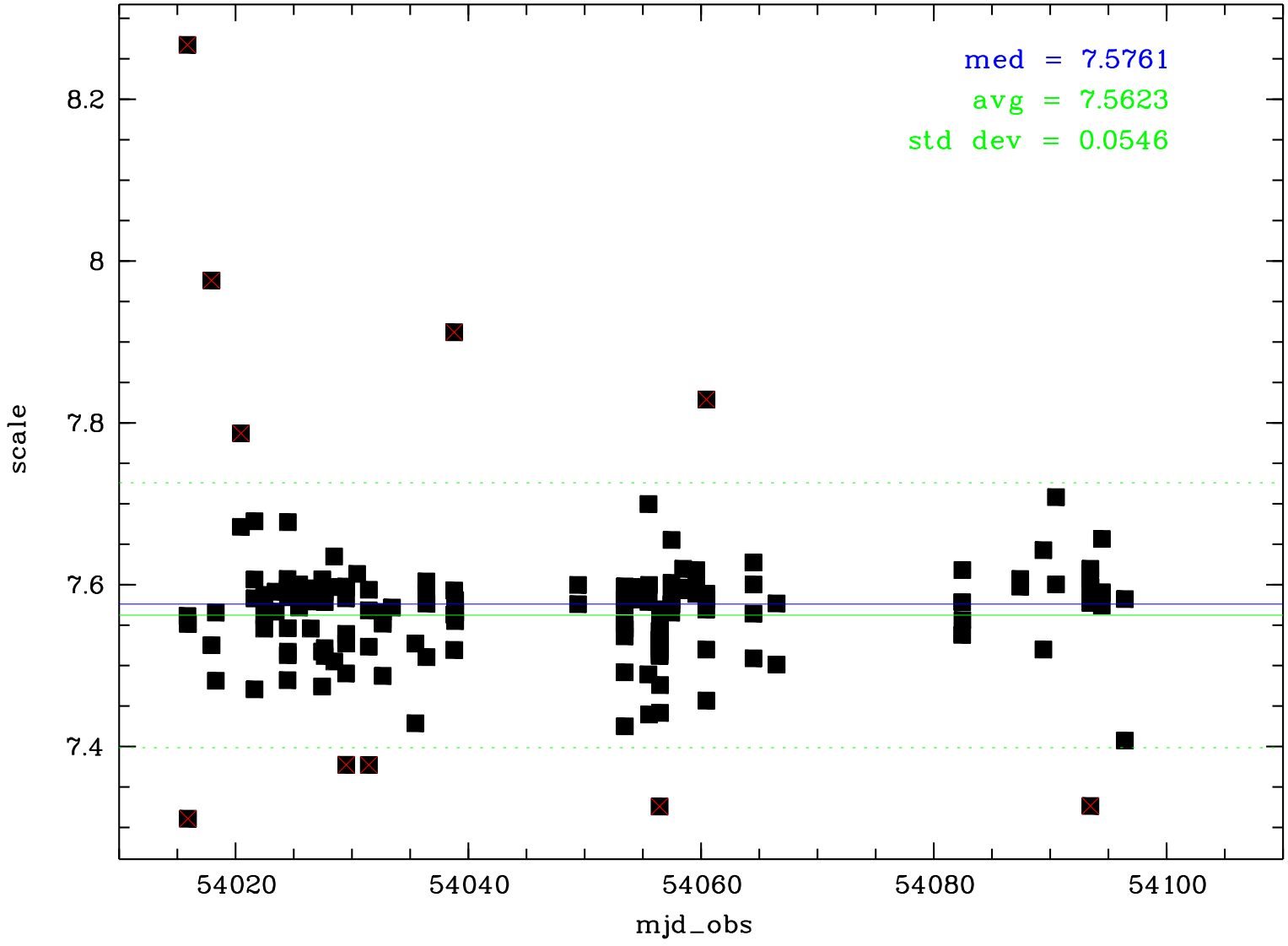

MIDAS_00 display_0
CHANL: 0
FRAME: F2_PRLX_061009A_G600z_0
CUTS: 0.0,900.0
START: 7372.43018,2.0
END: 10563.83008,794.0
MIN,MAX: -364.99133,5005.05664

# *Quality Control*

Additional possibilities

- ⋆ zeropoint of spatial curvature coefficients
- ⋆ transformation scale

# Transformation Scale



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# The End!