WFC3/IR Grism Calibration or something

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Abstract

We reduce the two sets of WFC3 (Wide Field Camera 3) IR (Infrared) grism observation of the stars GD-71 and GD-153 using `grizli` *(Is there a paper to cite here?). We examine each order fringe from the grism filters G102 and G141 and how they compare with the CDBS models. We find good comparison at the first order, and weakening comparison at higher orders. Similarly we (may or maybe I just need to reduce better) find G141 better calibrated than G102. This is a wild grizzly ride...*

Introduction

WFC3 (Wide Field Camera 3) has grisms (a grating and prism combination used for spectroscopy) for the UVIS and IR channels. In the IR, much work has gone into precisely calibrating the grisms (G102 and G141). Specifically, `grizli` – an open source reduction suite (Brammer?) was created to extract grism observations and produce the high quality slitless spectroscopy with WFC3. However, `grizli` depends not only on accurate extraction of flux but also on aligning the extraction with the observation. With this project we aimed to extract two sets of WFC3/IR grism observations of GD-71 and GD-153 and compare the WFC3 slitless spectroscopy to the exisiting spectroscopy both from STIS (the Space Telescope Imaging Spectrograph) and the X-Shooting Spectral Library.
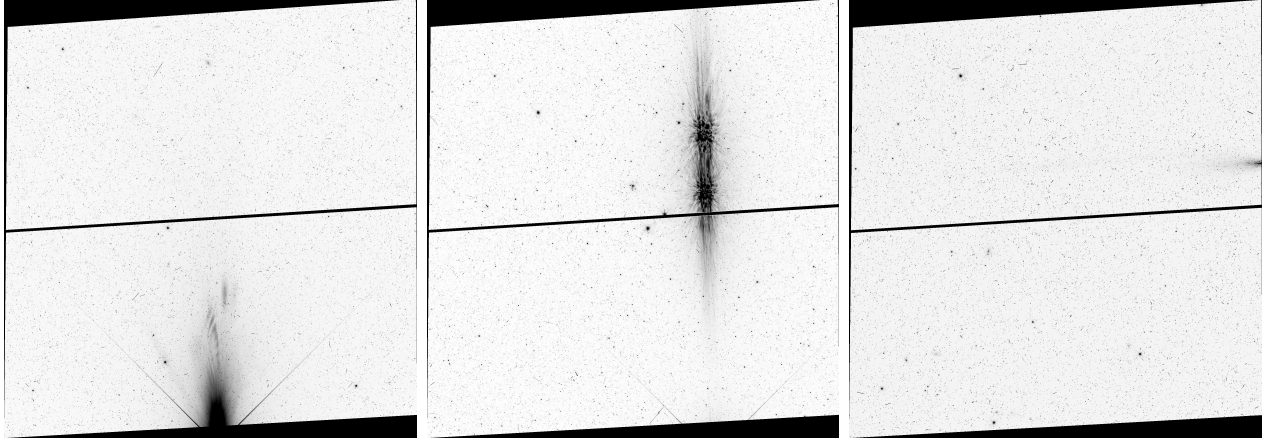
Fig. 1.—*Left: From the bottom of the image a prominent example of Dragon's Breath spills into the image. Middle: In this image a dramatic example of Scattered Light projects an effect into the middle of the detector image. Right: A more subtle example of Dragon's Breath from the top right, this resembles the bulk of Dragon's Breath effects.*

Effect	Pixels within Region	Mean Pixel Value	Median Pixel Value
Large Anomaly	1.0×10^6	130.5	59.6
Small Anomaly	1.1×10^6	44.9	29.2
No Anomaly	1.0×10^6	40.1	27.9

Table 1:*By comparing the counts in three regions, one entirely made up by an anomaly, one with a small anomaly, and one with just image background, we can quantitatively compare the impact of Dragon's Breath on an image.*

Data

We began with two data sets on GD-71 and GD-153. Both utilized both IR grisms (G102 and G141) and had matching direct observations in at least F105 and F140 repsectively, and some with additional matching direct filters F... and F...

Grism Extraction with `grizli`

It is non-trivial to extract these punk grisms. ...

Analysis

There are some flux profiles and sensitivity curves...

Updates to Flux Extraction and Spectral Trace??

I'm honestly not sure at this point if our results will be – THESE ARE OUR discrepancies or – THESE ARE HOW WE FIXED THEM...

Acknowledgements

Whoever edits this?

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Appendix A