Spex Young Star Atlas

Oh, an empty article!

You can get started by **double clicking** this text block and begin editing. You can also click the **Insert** button below to add new block elements. Or you can **drag and drop an image** right onto this text. Happy writing! **?** Duchêne & Kraus (2013)

1. Introduction

We want to write a paper like John Rayner's Rayner et al. (2003) Vacca et al. (2003)

2. Observations

All of the objects discussed in this paper were observed with the NASA Infra-Red Telescope Facility (IRTF) and the SpeX instrument Rayner et al. (1998) in the short-wavelength cross-dispersed mode (SXD). During observations we collected two distinct types of data. One set before Spex was updated and another after. The most recent upgrade to Spex occurred in August 2014. This upgrade increased the observable wavelength. See table 1 for comparison.

[HOW DO I PROPERLY CITE WAVELENGTH RANGE IN TABEL]**?**.

Calibration frames, flats and arcs, were taken immediately after collecting data on a particular science object. The final step was to obtain the remaining calibration data, pertaining to a particular A0V standard. Which A0 to observe was determined by location and airmass. For our purposes, an ideal standard would deviate from the science objects' airmass by no more than 0.15 and be located in the same region of the sky as the science object. This ensured minimal atmospheric derivations between our science and A0V stars.

Observations were made in AB pairs. After the initial A frame is taken the telescope offsets ("nods") and captures a B frame with the same science target at a different position along the slit. Since our objects were treated as point sources this AB mode allows for the subtraction of the B frame from the A frame, A-B, leaving both positive and negative spectrum along with sky residuals **?**. Subtraction of these pairs allows for the removal of dark currents and sky residuals **?**.

Verion (SXD mode)	Wavelength Range	R (0.3" slit)
Spex (Pre-upgrade)	0.80-2.4 μ m	2000
Spex (Post-upgrade)	0.70-2.55 μ m	2000

After collecting data on a particular science object, calibration frames were taken. Before altering the telescope in anyway flats and arcs were taken. By not moving the telescope the time between observing an object and taking its corresponding calibration frames could be minimized. Such calibration frames are used to identify and subtract off noise generated by the detector.

Compairison of the data taken on each A0 standard to that of a well known A0, Vega, allowed for the determination of atmospheric residuals. Using Spextool made data reduction, in this manner, possible. The difference between an observed A0 and the model for Vega can be attributed to atmospheric conditions existing at the time of observation. The same atmospheric disturbances apply to all objects observed at the same time and airmass. Telluric corrections can now be applied to the spectra of each science object. During observations, integration times were altered as to maximize the Signal to Noise ratio (S/N). **?**

In August 2014, Spex was updated. Included in these updates was an increase in precision, which permitted Spex to take a larger number of wavelength samplings. This allowed for higher accuracy of collected data. A portion of the objects in this catalog were observed prior to the update occurring. For this reason it is necessary to compare data taken with each version of Spex. Figure 1 shows such a comparison for the object GSC 06801-00186. This object was observed on June 29, 2012 UT, before Spex was updated, and again on June 15, 2015, after uSpex was implemented **?**. It is clear from this figure that while the data taken with uSpex is more comprehensive, spectrum collected using Spex are still sufficiently accurate. Data collected with both Spex and uSpex follow the same procedure discussed above.

[NEED NAME OF PERSON WHO COMPLETE BINART SURVEY - DAVID L (GEMINI)?] [NEED NAME OF PERSON WHO COMPLETED ACCRETION DISK SURVEY] This database was build to better classify young stars (less than 10Myr old). For this reason it is essential that it includes stars of approximately the same age. One of the top places to look for stars that formed at approximately the same time is in star forming region, solidifying the choice of observing upperSco stars. Various parameters had to be met by each star before it was chosen for observation. In order to build a comprehensive library stars that encompassed a wide range of spectral classes needed to be included, from class M to O. Next, stars that were classified as having binary companions **?** were eliminated. Finally, any star that had been determined to have an accretion disk **?** was also removed from the target list. Restricting the selection of target objects based on such criteria ensures each observed spectrum is as isolated and representative as possible.

[NOTE IN TABLE THAT DATE INDICATES WHICH VERSION OF SPEX WAS USED IN OBSERVATION OF PARTICULAR OBJECT] [S/N calculated over range of 2.025-2.162 microns]

IV) Reference

Object	RA	Dec	Spectral Type	UT Date	J mag, flux(1.25 micron
CD 25-11942	17:06:00.85	-25:20:25.9	?	2015-06-15	3296
GSC 06208-00834	+16:06:31.65	-20:36:26.6	?	2012-06-29	1658
GSC 06213-00194	+16:13:18.65	-22:12:53.6	?	2012-06-29	1657
GSC 06213-00306AB	+16:13:18.19	-22:12:52.3	?	2012-06-29	1658
GSC 06793-00797	+16:13:02.68	-22:57:49.2	?	2012-06-29	1658
GSC 06793-00994	+16:14:02.15	-23:01:08.0	?	2012-06-12	1660
GSC 06793-01406	+16:16:17.80	-23:39:51.3	?	2012-06-29	1659
GSC 06801-00186 (oldSpx)	+16:14:59.03	-27:50:27.1	?	2012-06-29	1657
GSC 06801-00186	16:14:59.30	-27:50:17.9	?	2015-06-15	3295
HBC 649	16:34:09.09	-15:48:01.4	?	2015-06-15	3296
HD 133748	+15:06:51.76	-23:37:27.6	?	2012-03-22	1672
HD 137130	+15:25:08.91	-26:34:30.9	?	2012-03-22	1672
HD 138485	+15:32:55.67	-16:51:16.5	?	2012-06-12	1663
HD 141813	+15:51:54.35	-26:22:09.2	?	2012-06-12	1658
HD 142097	+15:53:21.87	-21:58:20.6	?	2012-06-12	1658
HD 142424	+15:55:17.16	-23:22:17.4	?	2012-07-18	1662
HD 14311	+15:58:57.31	-13:10:14.3	?	2012-06-12	1661
HD 143472	+16:01:26.93	-25:11:56.6	?	2012-07-18	1644
HD 143567	+16:01:55.60	-21:58:50.4	?	2012-07-18	1661
HD 144470	+16:06:48.96	-20:40:14.4	?	2012-06-12	1782
HD 146266	+16:16:23.32	-25:03:49.1	?	2012-07-18	1662
HD 146743	+16:18:39.41	-21:35:39.6	?	2012-06-12	1660
HD 146899	+16:19:38.05	-26:52:31.6	?	2012-06-29	1656
HD 147137	+16:20:50.48	-22:35:45.2	?	2012-06-12	1661
HD 147196	+16:21:19.54	-23:42:34.9	?	2012-06-12	1661
HD 148040	+16:26:29.32	-27:41:17.0	?	2012-03-22	1671
HD 148153	+16:27:12.68	-27:11:27.2	?	2012-06-12	1659
HIP 61412	12:35:00.73	-26:42:46.3	?	2015-06-15	3296
HIP 70753	14:28:10.35	-29:29:26.1	?	2015-06-15	3295
HIP 71982	14:43:19.42	-10:35:13.5	?	2015-06-15	3297
HIP 73990	15:07:14.53	-29:30:01.5	?	2015-06-15	3296
HIP 76633	15:39:00.11	-19:43:50.9	?	2015-06-15	3297
HIP 77909	15:54:38.54	-25:14:42.4	?	2015-06-15	3296
HIP 78207	15:58:11.48	-14:16:40.6	?	2015-06-15	3296
HIP 78721	+16:04:14.14	+50:30:03.7	?	2012-06-12	1661
HIP 78933	16:06:48.64	-20:40:02.7	?	2015-06-15	3297
HIP 78977	+16:07:17.56	-22:03:39.8	?	2012-06-29	1659
HIP 79031	16:07:51.15	-24:27:47.7	?	2015-06-15	3296
HIP 79369	16:11:55.19	-21:06:10.4	?	2015-06-15	3296
HIP 79599	16:14:28.97	-21:06:20.4	?	2015-06-15	3296
HIP 82319	16:49:10.74	-22:42:46.5	?	2015-06-15	3297
RXJ 1558.2-0023	+15:58:12.83	-23:28:41.9	?	2012-06-12	1660
RXJ 1602.0-2221	+16:02:00.39	-22:21:23.7	?	2012-06-29	1657
Sco 160900.7-19085	+16:09:00.79	-19:08:56.0	?	2012-06-29	1658
ScoPMS 008b	+15:55:16.86	-23:22:29.8	?	2012-07-18	1663

- Rayner et al. (2003)
- cite whomever was referenced as identifying binaries **?**
- cite whomever was referenced as identifying accretion disks **?**
- when update of Spex occurred **?**
- **?**

3. Data Reduction and Analysis

I) Calibration frames

II) Extracting Spectra

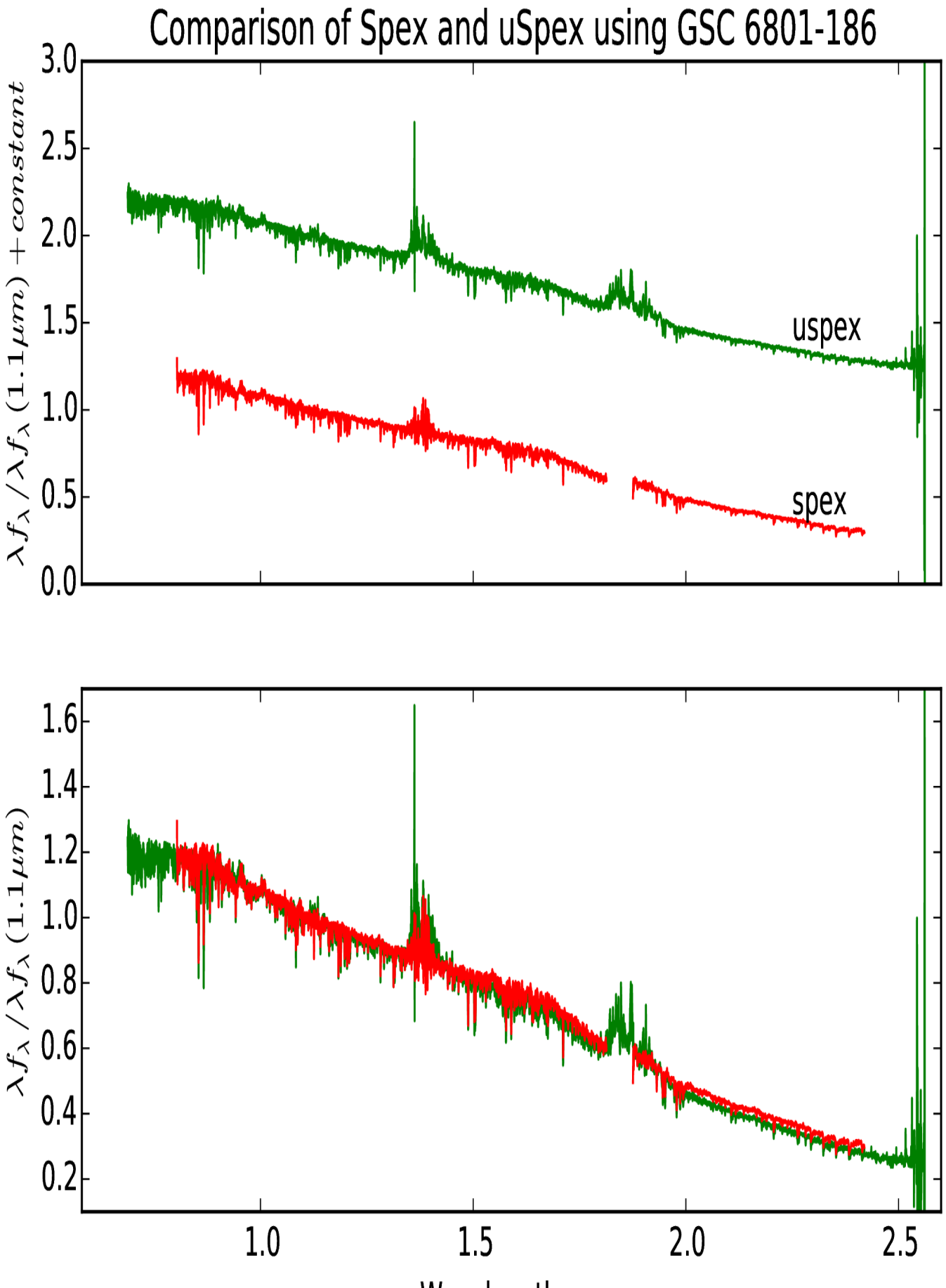
III) Combining fits files
A) masking/removing spectra
i) removal of cosmic ray interaction
ii) masking other parts: outliers, bad S/N
B) general cleaning

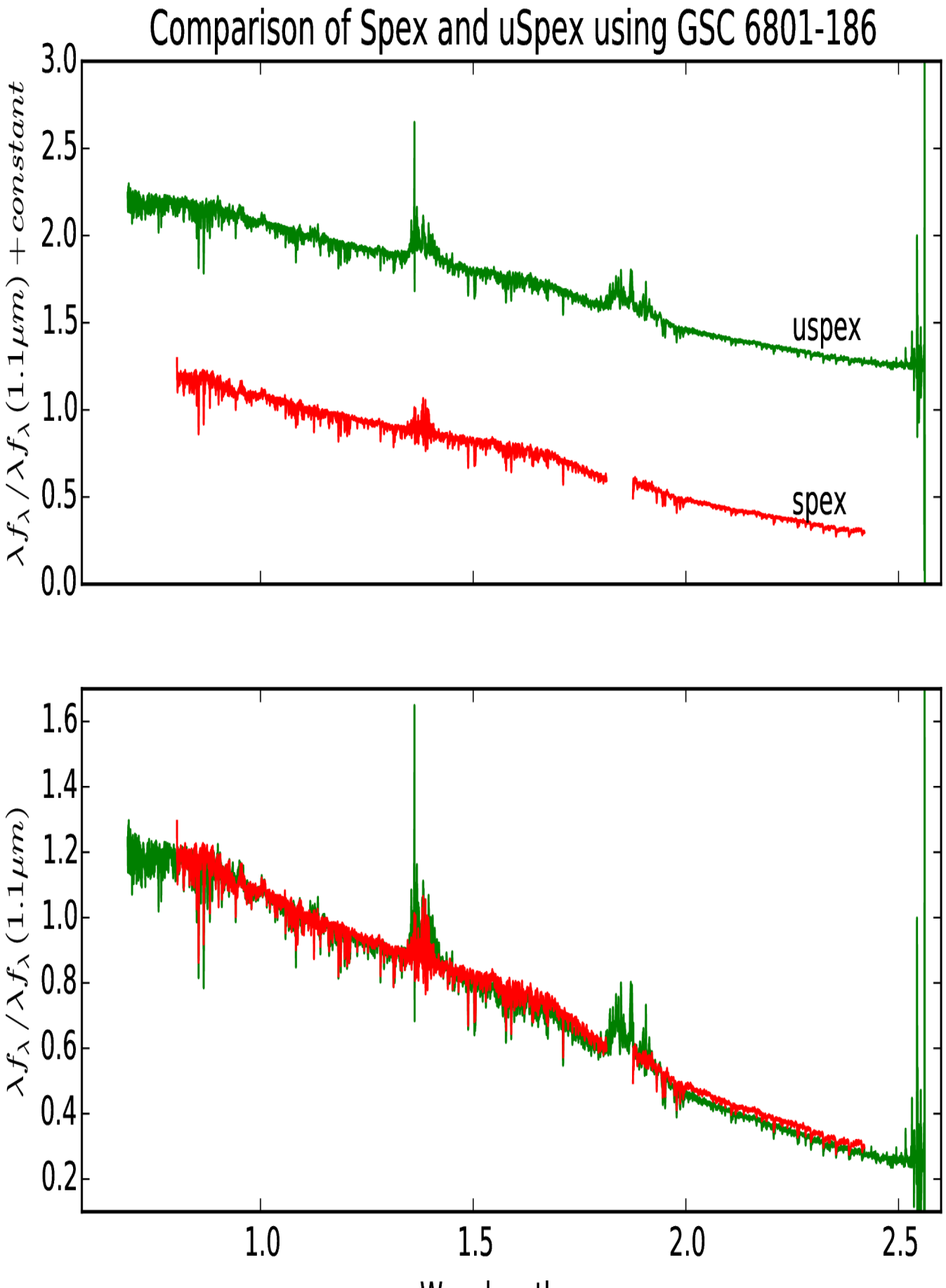
IV) Telluric reduction
A) B-V
B) verified airmass isn't to high
C) construction of Kernel
D) Scale lines
E) get shift

V) Merging orders
A) scaling orders to match
B) combining to produce a continuous spectrum

VI) Refrences a) Lord, S. D., 1992, NASA Technical Memorandum 103957, and acknowledge Gemini Observatory. for telluric transmission regions shown in gray on plots

4. Comparison with Models


Comparison of Spex and uSpex using GSC 6801-186
$\lambda f_\lambda / \lambda f_\lambda\,(1.1\mu m) + constant$
uspex
spex
$\lambda f_\lambda / \lambda f_\lambda\,(1.1\mu m)$
Wavelength


Comparison of Spex and uSpex using GSC 6801-186
$\lambda f_\lambda / \lambda f_\lambda\,(1.1\mu m) + constant$
uspex
spex
$\lambda f_\lambda / \lambda f_\lambda\,(1.1\mu m)$
Wavelength