5MUSES: 5 Milli-Jansky Unbiased Spitzer Extragalactic Survey

Final Data Delivery, Sep 2011

Prepared by Yong Shi on behalf of the 5MUSES team

1. Introduction

This document describes the final data release (DR2) of the Spitzer Legacy Program 5MUSES (PI: George Helou, PID: 40539), which includes all data delivered previously. The 5 mJy Unbiased Spitzer Extragalactic Survey is a mid-infrared spectroscopic survey of 330 galaxies with 5 mJy<f_ν(24 μm)<100 mJy, observed with the Infrared Spectrograph (IRS) on board the Spitzer Space Telescope. It provides a representative sample with a modeled 10th to 90th percentile range of 1×10^{10} $L_\odot$ to 2×10^{13} $L_\odot$ and z=0.05 to z=0.75, and bridges the gap between nearby spirals and ULIRGs (z$\sim$0), and the much fainter and more distant sources pursued in most IRS follow-up work to date (z$\sim$2). This delivery contains reduced low-resolution IRS spectra for all galaxies as well as reduced high-resolution IRS spectra for 21 galaxies in the 5MUSES sample. We list the content of this final data delivery in Section 2. In Section 3, we provide a description of the post-BCD processing for IRS data. The description of the 5MUSES project is also published in Wu et al. (2010) and Helou et al. (2011).

The 5MUSES public website is currently hosted at:
http://5muses.ipac.caltech.edu

2. Content of the data delivery

2.1 Sample

5MUSES is a mid-infrared spectroscopic survey of 330 galaxies with 24 μm flux densities 5 mJy < f_ν (24μm) < 100 mJy. The sources are selected from the SWIRE (Elais-N1, Elais-N2, Lockman Hole, and XMM) and the Extragalactic First Look Survey (XFLS) fields, covering a total area of 40.6 deg^2 on the sky. It provides a representative sample at intermediate redshift (<z> = 0.144), previously unexplored by Spitzer since most of the spectroscopic work was focused on nearby spiral galaxies (SINGS), local LIRGs, and ULIRGs, and much fainter (z $\sim$ 2) galaxies. A total of 1111 objects, excluding stars using IRAC colors and associations with other ancillar catalog in the field, have f_ν(24μm) between 5 and 100 mJy from the five survey fields of 5MUSES. In order to efficiently observe the objects using the staring mode of IRS and include the largest fraction of a galaxys integrated light, only objects unresolved within an aperture of d = 10.5" (corresponding approximately to the slit width of the Long-Low module of IRS) are included in the final pool and this results in a total of 800 sources. Then 330 objects are randomly selected from the 800 final candidates.

In this data release, we deliver all IRS spectra in the Short Low (SL, 5.2-14.5 μm) and Long Low (LL, 14.0-38.0 μm) modules, therefore covering the whole range of observed wavelength from 5.3 to 38 μm. We also deliver the IRS spectra in the Short High (SH, 9.9-19.6 μm) and Long High (LH, 18.7-37.2 μm) modules for 21 galaxies with high-resolution observation. The IRS spectra with associated uncertainties are in ASCII (*.tbl) format and the flux density units are Jy. Information on the sources in the current release is given in Table 2, in which we list the object names, RA and Dec positions, as well as their aorkeys and 24 μm flux densities measured from 12.7 arcsecond diameter aperture using SExtractor.

2.2 File Naming Convention

For each galaxy, the IRS spectrum is delivered in two segments, one for each of the IRS low-resolution modules. The files follow the naming convention of rxxx_md.tbl, where "xxx" is the aorkey of the source, and "md" is the module, either "ch0" for SL, or "ch2" for LL. For multiple sources observed in fixed-cluster mode, we differentiate them by adding an alphabetical suffix, eg. r24148992b_ch0.tbl is the SL spectrum of the second source observed in aorkey 24148992. All spectra are formatted as ASCII files in the IPAC table format. The headers are reproduced from the first data collection event in each module.

3. IRS data Processing

3.1 IRS low-resolution spectra

3.1.1 Sky subtraction

All 5MUSES observations are taken in the IRS staring mode. The SSC pipeline versions are SS16.1.0, S17.0.4, S17.2.0, S18.0.2 and S18.1.0. For the low resolution spectra, off-source data on the slit are used for sky subtraction. We take the median of all images from the off-source part of the slit and then subtract it from the image on the source. Then we combine the images by taking the mean of all images at one nod position. The sky-subtracted images are then cleaned with IRSCLEAN to remove the bad pixels using the default parameters. The rogue pixel mask is produced "on-the-fly" by setting the "getFmask" keyword. Typically $\sim$120 NaN pixels are masked by the program.

3.1.2 IRS low-resolution spectral extraction

The background-subtracted cleaned image fits files of each order at each nod position are then processed with the Spitzer IRS Custom Extraction (SPICE) for extraction of spectra. The input files also include the cleaned bmask and uncertainty files. We use the default extraction aperture, and the point-source calibration. We specify the order of images so that SPICE sums in columns the pixel values of that part of the image, and select the peak of the spatial profile. Then we run the extraction process and SPICE sums in rows the pixel values in the extraction aperture. The output from SPICE produces one spectrum at one nod position (1st or 2nd) for each order (1st and 2nd/3rd) of each module (SL or LL).

Spectra at nod position 1 and 2 are then combined with a clipped mean. Pixels are flagged when the difference between two nod positions exceed 0.005 Jy. For the flagged pixels, we take the average of adjacent pixel values for each nod position. Then we compare this averaged flux with the flagged pixel value for each nod. The averaged flux with smaller difference is then used as the flagged pixel for both nod positions. Then the average spectra at different orders are stitched. We do not use any scaling factors between adjacent orders, because order mis-match (noticeable jump in flux density between spectral orders) is only detected in a few sources (see section on individual objects). We also trim the end of the orders where the noise rises quickly (see Figure 2 for sample spectra).

3.1.3 Notes on individual objects

Order mis-matches are sometimes seen in the IRS spectra between the 1st order of SL (SL1, 7.4-14.5μm) and 2nd order of LL (LL2, 14.0-21.3μm). Eight objects have mis-matches: 5MUSES-072, 5MUSES-087, 5MUSES-159, 5MUSES-161, 5MUSES-173, 5MUSES-182, 5MUSES-270 & 5MUSES-327.

For some objects, the continua of the LL2 spectra at the red end of one nod position ($\sim 18 - 20\,\mu$m) drops abnormally and do not agree with that of the other nod position. For these cases, we have therefore discarded the spectral nods where the LL2 flux density drops are evident from the processing and delivery. The following is a list of such objects: 5MUSES-014, 5MUSES-015, 5MUSES-050,5MUSES-054,5MUSES-056, 5MUSES-059,5MUSES-064, 5MUSES-074, 5MUSES-076, 5MUSES-077, 5MUSES-080, 5MUSES-081, 5MUSES-088, 5MUSES-089, 5MUSES-091, 5MUSES-099, 5MUSES-100, 5MUSES-102, 5MUSES-104, 5MUSES-111, 5MUSES-117, 5MUSES-122, 5MUSES-136, 5MUSES-147, 5MUSES-155, 5MUSES-156, 5MUSES-157, 5MUSES-162, 5MUSES-167, 5MUSES-184, 5MUSES-197, 5MUSES-199, 5MUSES-200, 5MUSES-209, 5MUSES-210, 5MUSES-219, 5MUSES-242, 5MUSES-256, 5MUSES-257, 5MUSES-267, 5MUSES-280, 5MUSES-285, 5MUSES-293, 5MUSES-300, 5MUSES-304, 5MUSES-315, 5MUSES-318 and 5MUSES-321, 5MUSES-322 & 5MUSES-325.

3.1.4 Photometric comparisons

Synthetic MIPS 24 μm flux densities were derived by convolving the MIPS filter with the IRS LL spectra. We calculate the ratios of IRS LL and MIPS 24 μm flux densities and plot them versus the MIPS values in Figure 3. On average, the IRS LL and MIPS 24 μm flux densities agree within 10%, with the IRS fluxes seemingly low compared to MIPS below 10 mJy but agreeing well above 10 mJy (see IRS manual for the LL1 24 micron deficit).

3.2 IRS high-resolution spectra

3.2.1 Sky subtraction

The SSC pipeline for the high-resolution data is S17.2.0. For each object, sky observations in the vicinity were also executed, with on-sky integration time similar to those spent on-source. The bcd files of the LH wavelength data were processed by the IDL routine DARK_SETTLE posted at the SSC webpage to correct for gradations of the dark current along the detector which lead to order tilting and mismatch.

Using the SH bcd files and LH dark settled bcd files, we compute the on-source and on-sky frame for each set of observations. Specifically, we compute the (dark settled) average image for each target, each nod position and each wavelength λ range (i.e., SH and LH). While we choose the average images as our science frame, we also computed the median image for each target, nod position, and module. We substituted all pixels where the difference of the average from the median image value exceeded 3 times the standard deviation σ of the median image with their value in the median image. The algorithm that we used was therefore similar to a p-clip averaging routine. We then computed the sky-subtracted science frames by removing the sky image from the source image for each λ range and nod position.

Table 1: Exposure Time As A Function Of 24 μm Flux Density

Flux Range [mJy]	**Integration time [sec] SL2-SL1-LL2-LL1**	**Integration Time (sec) SH-LH**	**AOR Duration [secs]**
5 to 7	488-488-488-488	000-000	2861
7 to 10	488-244-244-244	000-000	1968
10 to 15	244-244-189-189	000-000	1582
15 to 25	244-122-126-126	000-000	1276
25 to 100	122-122-63-63	488-488	2255

3.2.2 IRS high-resolution spectral extraction

The next step was to the removal of bad and rogue pixels from the sky-subtracted images. We used the individual sky frames for all sources to create a generic bad pixel mask, that we merged with the bad pixel map available at the SSC webpage for each Spitzer Campaign. We merged this generic "super" mask with the mask of each individual (on-source and on-sky) exposure to create the mask of each science frame, nod position, and IRS module. Following this procedure, we further identified pixels with "NaN" values and outliers. We defined as outlier pixels that fell into one of the following categories:

a) their value was below -1$\times\sigma$,

b) their absolute value exceeded 1$\times\sigma$ and they were located within 2 pixels in any direction from the edges of any spectral order, or

c) their value exceeded 20$\times\sigma$ and they were located in the useful detector range, which we define as the area whose limits are >2 pixels away from the edges of any spectral order.

All rogue pixels and outliers were flagged in the mask file. In the science frame, their values were replaced with the median value of the frame, which was computed using all other pixels in the useful detector range. A final visual inspection and manual cleaning of the science frames was performed using the IRSCLEAN routine.

The uncertainty of the average on-source frame was calculated as the square root of the sum of the squares of all individual uncertainty files, divided by the number of exposures. We computed the sky frame uncertainty in a similar way and combined the two uncertainties to produce the uncertainty of the final science frame.

We used the science frame, together with its uncertainty and mask file as input to the SSC software SPICE, that produces the 1-d spectrum from 2-d spectral images. To extract the spectra, we used the regular extraction mode, which collapses all pixels along each row for high-resolution data, equally weighing each pixel. The spectra that SPICE produces are wavelength and flux calibrated, and they are given for each individual order. We merged the spectra of the various orders to a single spectrum for each nod position, clipping noisy edges (between 2-25 pixels, depending on the order). This task was performed for both the short-high (SH) and the long-high (LH) datasets. The SH and LH spectra were then merged to produc the full-λ-range spectrum per nod position.

The final spectrum of each object was produced by averaging the 1-d, full-λ-range spectra of the two nod positions. For pixels where the two nod positions deviated by more than 1$\times\sigma$ and one of the two positions had a bad pixel, we only used the value of the nod position with the reliable value. At the wavelengths of atomic/molecular lines, only nod positions without bad pixels were used when possible (see Figure 2 for sample spectra).

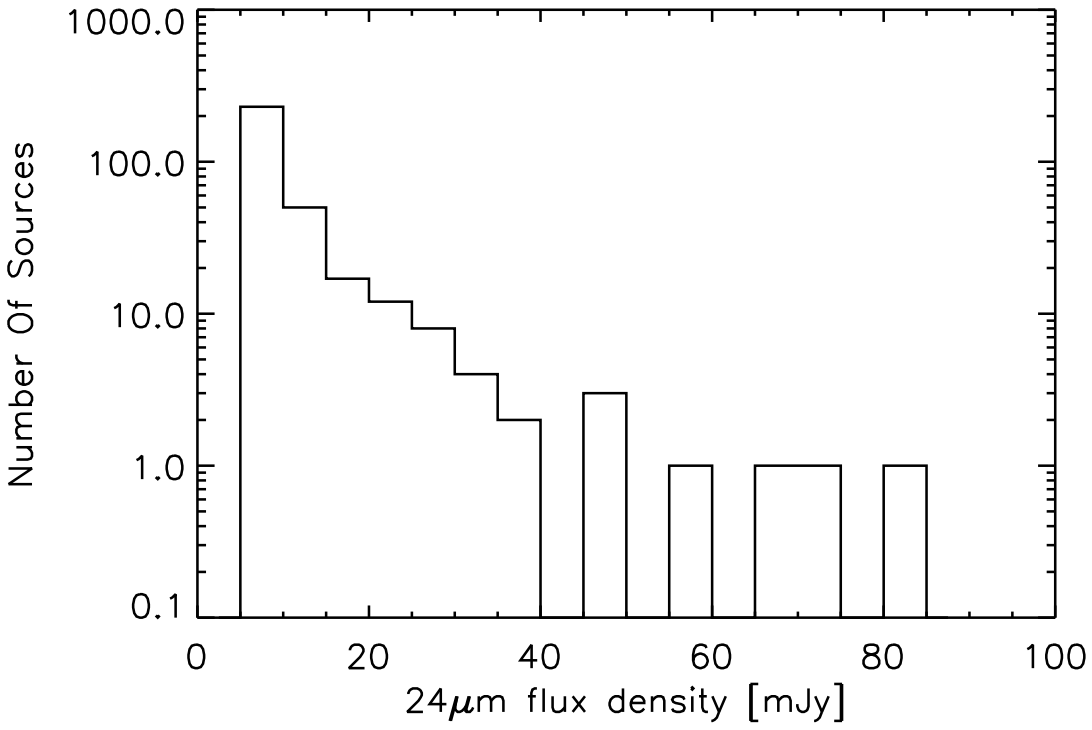

Figure 1: A histogram of the 24 μm flux densities of the 5MUSES sample.

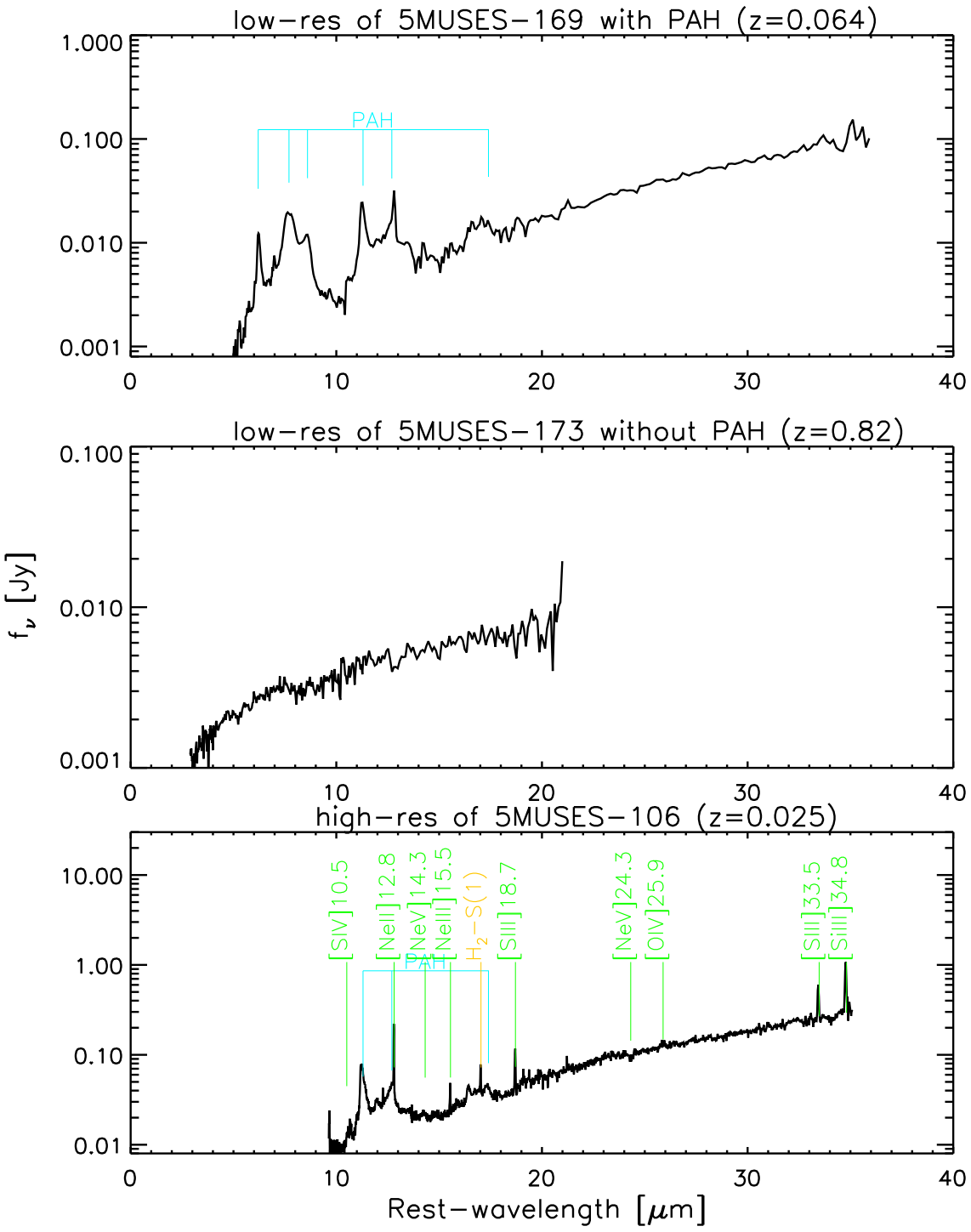

Figure 2: Sample spectra of our 5MUSES objects. The first two are the low-resolution spectra for two galaxies with strong PAH and pure continuum, respectively, while the third is the high-resolution spectrum.

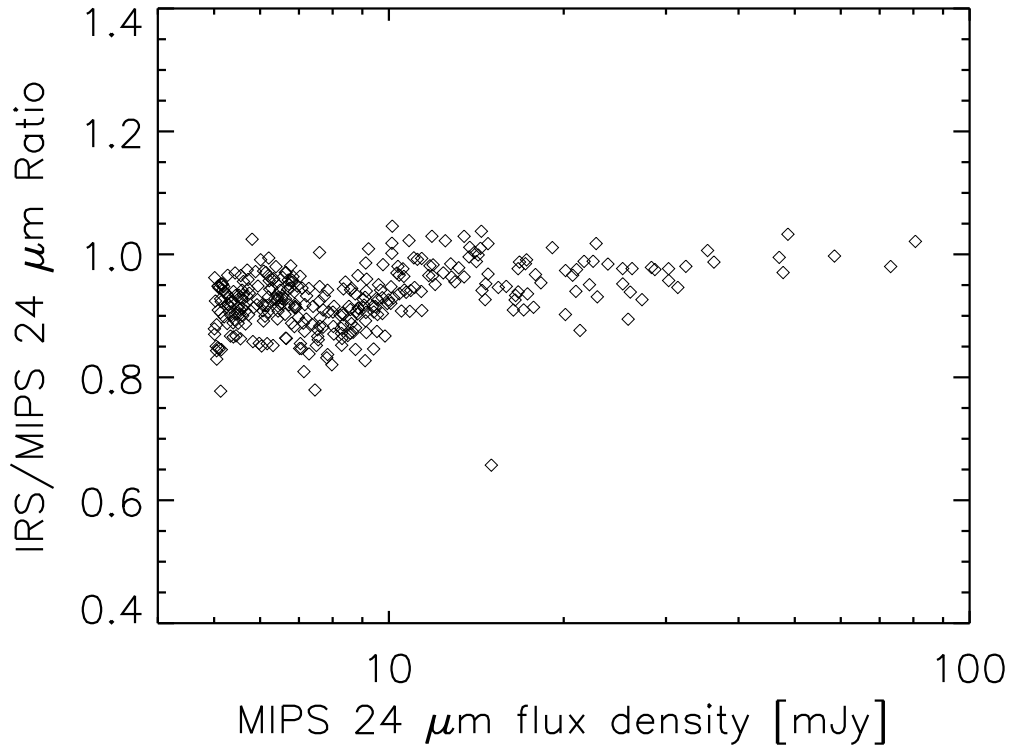

Figure 3: The MIPS 24 μm flux densities of the sources versus the ratio of synthetic 24 μm fluxes from IRS LL spectra, to the MIPS 24 μm fluxes.

Table 2: 5MUSES Sources in Data Delivery 2

Name	NED Name	RA Dec (J2000)	AORKEY	$F_\nu(24\,\mu m)$
5MUSES-001	GALEX2693022864917923366	02 14 08.1 -03 53 05	r24184320	10.05
5MUSES-002	APMUKS(BJ)B021232.72-043817.8	02 15 03.6 -04 24 22	r24170240a	4.67
5MUSES-003	PMNJ0215-0343	02 15 11.5 -03 43 08	r24170240b	4.90
5MUSES-004	2MASXJ02155710-0337286	02 15 57.1 -03 37 29	r24183296a	7.40
5MUSES-005	SWIREJ021638.21-042250.8	02 16 38.2 -04 22 51	r24183040a	14.52
5MUSES-006	*FBQSJ0216-0444	02 16 40.7 -04 44 05	r24182272	13.98
5MUSES-007		02 16 47.1 -03 47 22	r24183040b	12.78
5MUSES-008	APMUKS(BJ)B021418.92-043947.0	02 16 49.7 -04 25 55	r24183040c	10.60
5MUSES-009	2MASXJ02165778-0324592	02 16 57.8 -03 25 00	r24179200	23.45
5MUSES-010	SWIREJ021729.06-041937.8	02 17 29.0 -04 19 38	r24183296b	7.97
5MUSES-011	SXDF0190	02 17 43.0 -04 36 25	r24176128	5.15
5MUSES-012	2MASXJ02174384-0517519	02 17 43.8 -05 17 50	r24175616	15.52
5MUSES-013	APMUKS(BJ)B021523.76-041215.7	02 17 54.8 -03 58 27	r24174592	10.01
5MUSES-014	SXDF0287	02 18 08.2 -04 58 45	r24194304a	7.53
5MUSES-015		02 18 21.2 -04 38 40	r24180224a	4.91
5MUSES-016	CIRSI21	02 18 30.6 -04 56 23	r24194304b	8.04
5MUSES-017		02 18 32.5 -05 05 46	r24194304c	9.60
5MUSES-018	APMUKS(BJ)B021619.09-053542.5	02 18 49.8 -05 21 58	r24180224b	4.92
5MUSES-019	APMUKS(BJ)B021628.71-041624.4	02 18 59.7 -04 02 37	r24170752	15.09
5MUSES-020	APMUKS(BJ)B021639.48-053859.7	02 19 09.5 -05 25 14	r24182016	24.06
5MUSES-021	SXDF0143	02 19 12.7 -05 05 42	r24180224c	5.96
5MUSES-022	2MASXJ02191605-0557269	02 19 16.1 -05 57 26	r24179712	10.98
5MUSES-023	2MASXJ02192835-0422399	02 19 28.4 -04 22 40	r24169472	17.11
5MUSES-024		02 19 30.3 -04 35 38	r24180224d	5.02
5MUSES-025	SWIREJ021938.70-032508.2	02 19 38.7 -03 25 08	r24179456a	6.04
5MUSES-026	2MASXJ02193906-0511336	02 19 39.1 -05 11 33	r24147456	31.83
5MUSES-027		02 19 47.5 -05 10 09	r24180224e	4.76
5MUSES-028	2MASXJ02195305-0518236	02 19 53.1 -05 18 24	r24165376	29.03
5MUSES-029	APMUKS(BJ)B021726.85-053825.1	02 19 57.0 -05 24 40	r24180224f	5.37
5MUSES-030		02 20 00.0 -04 39 49	r24180224g	5.96
5MUSES-031	SWIREJ022005.93-031545.7	02 20 05.9 -03 15 45	r24179456b	6.07
5MUSES-032	SWIREJ022012.21-034111.8	02 20 12.2 -03 41 12	r24179456c	6.31
5MUSES-033	NVSSJ022050-053716	02 20 50.4 -05 37 14	r24185088a	4.26
5MUSES-034	NGC0895a	02 21 45.1 -05 32 07	r24185088b	5.62
5MUSES-035	2MASXJ02214778-0257310	02 21 47.9 -02 57 31	r24176384	20.52
5MUSES-036	APMUKS(BJ)B021917.38-045953.4	02 21 47.6 -04 46 10	r24185088c	4.75
5MUSES-037	APMUKS(BJ)B021920.23-034251.4	02 21 51.5 -03 29 11	r24179456d	6.46
5MUSES-038		02 22 05.0 -05 05 38	r24185088d	6.08
5MUSES-039	2MASXJ02222327-0443198	02 22 23.3 -04 43 20	r24185088e	4.64
5MUSES-040		02 22 24.1 -05 05 50	r24185088f	5.56
5MUSES-041	APMUKS(BJ)B022010.98-051029.3	02 22 41.3 -04 56 52	r24165888a	4.19
5MUSES-042	NVSSJ022252-041642	02 22 52.0 -04 16 45	r24148224a	5.85
5MUSES-043	APMUKS(BJ)B022027.20-043217.5	02 22 58.0 -04 18 40	r24148224b	4.63

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Table 2 – continued from previous page

Name	NED Name	RA Dec (J2000)	AORKEY	$F_\nu(24\,\mu m)$
5MUSES-044	SWIREJ022301.97-052335.8	02 23 02.0 -05 23 36	r24165888b	6.50
5MUSES-045	APMUKS(BJ)B022039.26-053652.8	02 23 09.3 -05 23 16	r24165888c	4.85
5MUSES-046		02 23 15.0 -05 19 03	r24165888d	4.84
5MUSES-047	2MASXJ02231563-0406058	02 23 15.5 -04 06 07	r24174336a	8.60
5MUSES-048	APMUKS(BJ)B022058.50-044545.5	02 23 29.1 -04 32 10	r24174336b	7.62
5MUSES-049		02 23 34.6 -03 52 27	r24174336c	7.20
5MUSES-050		02 23 45.0 -05 42 34	r24171520	8.26
5MUSES-051	SWIREJ022356.49-025431.1	02 23 56.5 -02 54 31	r24171264	9.75
5MUSES-052	VIRMOS0.6GHzJ022413-042227	02 24 13.6 -04 22 27	r24174336d	9.31
5MUSES-053	APMUKS(BJ)B022151.56-041604.0	02 24 22.5 -04 02 31	r24164352	6.53
5MUSES-054	SWIREJ022431.58-052818.8	02 24 31.6 -05 28 19	r24152064a	7.96
5MUSES-055	APMUKS(BJ)B022203.51-042903.9	02 24 34.3 -04 15 30	r24152832a	5.38
5MUSES-056	APMUKS(BJ)B022208.33-044038.7	02 24 38.9 -04 27 06	r24152832b	6.12
5MUSES-057	2MASXJ02244700-0408515	02 24 47.1 -04 08 50	r24152832c	5.10
5MUSES-058	2MASXJ02245768-0414182	02 24 57.7 -04 14 18	r24164864	11.71
5MUSES-059	[CRK2003]J0225.0-0321NED03	02 25 05.5 -03 21 18	r24150272	5.42
5MUSES-060	APMUKS(BJ)B022236.69-043206.7	02 25 07.4 -04 18 35	r24152832d	6.65
5MUSES-061	SWIREJ022508.33-053917.7	02 25 08.3 -05 39 18	r24152064b	8.85
5MUSES-062	2MASXJ02252260-0454513	02 25 22.7 -04 54 52	r24186112	9.55
5MUSES-063	2MASXJ02253645-0500123	02 25 36.5 -05 00 12	r24147200	66.51
5MUSES-064	APMUKS(BJ)B022317.99-051421.1	02 25 48.2 -05 00 51	r24152064c	7.36
5MUSES-065	2MASXJ02254978-0400242	02 25 49.5 -04 00 28	r24146688	58.36
5MUSES-066		02 26 00.0 -05 01 45	r24162304a	5.17
5MUSES-067	APMUKS(BJ)B022332.58-050635.4	02 26 02.9 -04 53 08	r24146432	6.10
5MUSES-068	2MASXJ02260361-0459042	02 26 03.6 -04 59 04	r24142592	29.75
5MUSES-069	2MASXJ02261747-0504432	02 26 17.4 -05 04 43	r24194048	50.25
5MUSES-070	APMUKS(BJ)B022406.87-041208.9	02 26 37.8 -03 58 41	r24193792	12.98
5MUSES-071	VIRMOS1.4GHzJ022655-040301	02 26 55.9 -04 03 02	r24193024	6.28
5MUSES-072	XBSJ022707.7-050819	02 27 07.8 -05 08 16	r24162304b	5.34
5MUSES-073	2MASXJ02272073-0445374	02 27 20.7 -04 45 38	r24189696	71.67
5MUSES-074	APMUKS(BJ)B022508.18-050027.3	02 27 38.5 -04 47 03	r24169216	5.99
5MUSES-075	2MASXiJ0227416-045649	02 27 41.7 -04 56 51	r24168704	10.35
5MUSES-076	SDSSJ103049.58+575922.6	10 30 49.6 +57 59 24	r24175104	17.42
5MUSES-077	SDSSJ103237.47+580845.8	10 32 37.3 +58 08 47	r24145920a	5.50
5MUSES-078	SDSSJ103315.05+580816.6	10 33 15.1 +58 08 17	r24145920b	4.62
5MUSES-079	2MASXJ10345056+5844181	10 34 50.5 +58 44 19	r24153088	18.16
5MUSES-080	1NW026	10 35 13.9 +57 34 45	r24151296a	4.88
5MUSES-081	SDSSJ103527.18+583712.1	10 35 27.4 +58 37 11	r24166656a	6.32
5MUSES-082	SDSSJ103531.43+581234.3	10 35 31.4 +58 12 34	r24172800a	4.40
5MUSES-083	SDSSJ103542.77+583313.2	10 35 42.8 +58 33 14	r24166656b	6.44
5MUSES-084	SDSSJ103601.79+581836.3	10 36 01.7 +58 18 36	r24153856a	5.11
5MUSES-085	SDSSJ103606.45+581829.7	10 36 06.5 +58 18 30	r24173568	22.22
5MUSES-086	SDSSJ103646.41+584330.7	10 36 46.3 +58 43 31	r24153856b	6.39
5MUSES-087	SDSSJ103701.98+574415.0	10 37 01.8 +57 44 14	r24170496	12.58

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Table 2 – continued from previous page

Name	NED Name	RA Dec (J2000)	AORKEY	$F_\nu(24\,\mu m)$
5MUSES-088	SBS1034+583	10 37 24.7 +58 05 13	r24173312	7.70
5MUSES-089	SDSSJ103803.35+572701.6	10 38 03.4 +57 27 03	r24169984	14.60
5MUSES-090		10 38 13.9 +58 00 48	r24151296b	6.17
5MUSES-091	SDSSJ103818.17+583556.5	10 38 18.2 +58 35 57	r24174080	6.56
5MUSES-092	SDSSJ103839.11+581325.7	10 38 39.1 +58 13 26	r24172800b	6.27
5MUSES-093	SDSSJ103856.13+570334.1	10 38 56.1 +57 03 34	r24151296c	5.31
5MUSES-094	SDSSJ103937.36+580757.4	10 39 37.4 +58 07 58	r24172800c	5.16
5MUSES-095	SDSSJ103946.30+581630.4	10 39 46.4 +58 16 31	r24169728	14.90
5MUSES-096	SDSSJ104001.17+592604.6	10 40 01.7 +59 26 06	r24167936a	5.75
5MUSES-097	SDSSJ104016.33+570846.2	10 40 16.2 +57 08 47	r24151296d	4.88
5MUSES-098	SDSSJ104058.79+581703.3	10 40 58.8 +58 17 04	r24173824	10.07
5MUSES-099	SDSSJ104131.77+592258.6	10 41 31.8 +59 22 59	r24188416	5.95
5MUSES-100	SDSSJ104132.48+565953.1	10 41 32.5 +56 59 54	r24166400	7.53
5MUSES-101	SDSSJ104159.83+585856.5	10 42 00.0 +58 58 57	r24162816	21.44
5MUSES-102	SBS1039+581	10 42 55.6 +57 55 51	r24160256a	5.95
5MUSES-103	SWIREJ104303.50+585718.1	10 43 03.6 +58 57 18	r24167936b	5.08
5MUSES-104	SDSSJ104325.55+581852.7	10 43 25.7 +58 18 53	r24168960	8.09
5MUSES-105	2MASXJ10443291+5640420	10 44 32.9 +56 40 41	r24201472	28.00
5MUSES-106	CGCG290-067	10 44 38.3 +56 22 10	r24154112	82.35
5MUSES-107	SDSSJ104454.08+574425.9	10 44 54.1 +57 44 26	r24160256b	6.02
5MUSES-108	SDSSJ104501.73+571111.3	10 45 01.7 +57 11 11	r24168192	10.27
5MUSES-109	NVSSJ104516+592303	10 45 15.8 +59 23 06	r24153344a	4.31
5MUSES-110	2MASXJ10464333+5847154	10 46 43.3 +58 47 15	r24153344b	5.07
5MUSES-111	SDSSJ104658.98+571235.2	10 46 59.1 +57 12 35	r24153600a	6.78
5MUSES-112	SDSSJ104705.07+590728.4	10 47 05.1 +59 07 28	r24153344c	6.78
5MUSES-113	SDSSJ104723.04+555806.7	10 47 23.0 +55 58 07	r24150784	9.86
5MUSES-114	SDSSJ104729.85+572842.8	10 47 29.9 +57 28 43	r24144384	5.77
5MUSES-115	SDSSJ104837.80+582642.1	10 48 37.8 +58 26 42	r24168448	6.72
5MUSES-116		10 48 39.7 +55 53 56	r24184576a	8.54
5MUSES-117	SDSSJ104843.88+580341.2	10 48 43.9 +58 03 41	r24191232	5.78
5MUSES-118	SDSSJ104907.11+565715.3	10 49 07.1 +56 57 16	r24153600b	9.11
5MUSES-119	SDSSJ104918.33+562512.8	10 49 18.3 +56 25 13	r24184576b	6.70
5MUSES-120	SDSSJ104938.82+554605.6	10 49 39.0 +55 46 06	r24178176a	6.33
5MUSES-121		10 49 40.2 +55 58 04	r24178176b	4.79
5MUSES-122		10 49 55.6 +58 53 16	r24143104a	4.65
5MUSES-123	2MASXJ10500589+5614599	10 50 06.0 +56 15 00	r24163584	15.07
5MUSES-124	SDSSJ105047.79+590348.0	10 50 47.9 +59 03 49	r24143104b	4.91
5MUSES-125	SDSSJ105055.65+575601.0	10 50 55.7 +57 56 01	r24194560a	6.51
5MUSES-126	SDSSJ105058.76+560550.0	10 50 58.8 +56 05 50	r24178176c	5.04
5MUSES-127	SDSSJ105106.12+591625.1	10 51 06.1 +59 16 25	r24143104c	4.67
5MUSES-128	1EX076	10 51 28.1 +57 35 03	r24143616	9.25
5MUSES-129	SDSSJ105134.21+584600.9	10 51 34.2 +58 46 01	r24172544a	5.02
5MUSES-130	SDSSJ105158.52+590652.0	10 51 58.5 +59 06 52	r24143104d	4.96
5MUSES-131	SDSSJ105200.29+591933.6	10 52 00.3 +59 19 34	r24156160	11.31

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Table 2 – continued from previous page

Name	NED Name	RA Dec (J2000)	AORKEY	$F_\nu(24\,\mu m)$
5MUSES-132	2MASXJ10520659+5809476	10 52 06.6 +58 09 47	r24178944	16.30
5MUSES-133	SDSSJ105336.85+580350.6	10 53 36.8 +58 03 52	r24159232a	5.50
5MUSES-134	SDSSJ105352.01+581921.8	10 53 51.9 +58 19 19	r24172544b	4.92
5MUSES-135	SDSSJ105404.10+574019.7	10 54 04.1 +57 40 20	r24194560b	7.81
5MUSES-136	2MASXJ10542172+5823445	10 54 21.6 +58 23 45	r24156928	16.57
5MUSES-137	SDSSJ105511.54+572552.7	10 55 11.6 +57 25 53	r24159232b	5.26
5MUSES-138	SDSSJ105604.85+574230.2	10 56 04.5 +57 42 30	r24146176a	11.10
5MUSES-139	SDSSJ105636.94+573449.4	10 56 37.0 +57 34 50	r24158464a	6.26
5MUSES-140	SDSSJ105641.79+580046.1	10 56 41.8 +58 00 46	r24158208a	6.39
5MUSES-141	VIIZw353NOTES01	10 57 05.4 +58 04 37	r24145408	15.42
5MUSES-142	2MASXJ10573350+5657376	10 57 33.5 +56 57 37	r24145152a	5.04
5MUSES-143	SDSSJ105740.55+570616.5	10 57 40.6 +57 06 17	r24145152b	5.92
5MUSES-144		10 58 29.3 +58 04 39	r24158208b	6.32
5MUSES-145	SDSSJ105854.06+574130.0	10 58 54.0 +57 41 30	r24158464b	5.56
5MUSES-146	SDSSJ105903.47+572155.1	10 59 03.5 +57 21 55	r24146176b	13.94
5MUSES-147	SDSSJ105951.69+581803.0	10 59 51.8 +58 18 03	r24192000	4.94
5MUSES-148	SDSSJ105959.93+574848.1	11 00 00.0 +57 48 48	r24158208c	8.32
5MUSES-149	SDSSJ110002.03+573142.2	11 00 02.0 +57 31 42	r24158208d	7.88
5MUSES-150		11 00 14.0 +58 10 36	r24158464c	6.45
5MUSES-151	SDSSJ110124.97+574316.0	11 01 25.0 +57 43 17	r24158464d	5.51
5MUSES-152		11 01 33.8 +57 52 07	r24158464e	5.90
5MUSES-153	SDSSJ110223.56+574436.2	11 02 23.6 +57 44 37	r24146176c	9.46
5MUSES-154	SDSSJ110235.01+574655.7	11 02 35.1 +57 46 56	r24158464f	5.98
5MUSES-155	SDSSJ155832.91+544427.1	15 58 32.9 +54 44 27	r24145664	7.98
5MUSES-156	SDSSJ155833.20+545937.0	15 58 33.2 +54 59 37	r24167424a	6.04
5MUSES-157	SDSSJ155936.13+544203.8	15 59 36.1 +54 42 04	r24172288	13.62
5MUSES-158	SDSSJ160038.82+551018.6	16 00 38.9 +55 10 18	r24150528	19.62
5MUSES-159		16 01 12.0 +55 32 57	r24149760a	8.34
5MUSES-160	1RXSJ160114.0+551306	16 01 14.3 +55 13 01	r24149760b	7.14
5MUSES-161	SDSSJ160121.24+543622.2	16 01 21.3 +54 36 23	r24148992a	4.73
5MUSES-162	SDSSJ160128.54+544521.3	16 01 28.6 +54 45 21	r24147712	12.34
5MUSES-163	IRASF16022+5450	16 03 22.8 +54 42 38	r24148992b	5.49
5MUSES-164	SDSSJ160333.67+553819.3	16 03 33.7 +55 38 19	r24149760c	7.43
5MUSES-165	2MASXJ16034131+5526135	16 03 41.4 +55 26 13	r24167424b	4.81
5MUSES-166	SDSSJ160358.20+555504.3	16 03 58.3 +55 55 06	r24162560a	4.36
5MUSES-167	SDSSJ160401.22+551502.6	16 04 01.3 +55 15 02	r24149504	10.68
5MUSES-168	ELAISC15J160408.4+542530	16 04 08.4 +54 25 30	r24148992c	4.82
5MUSES-169	2MASXJ16040835+5458125	16 04 08.3 +54 58 13	r24142848	25.62
5MUSES-170	SDSSJ160410.13+555155.7	16 04 10.2 +55 51 56	r24185600a	6.79
5MUSES-171	2MASXJ16044063+5534089	16 04 40.6 +55 34 09	r24194816	21.27
5MUSES-172	SDSSJ160539.53+562503.4	16 05 39.4 +56 25 01	r24186368	9.27
5MUSES-173	SDSSJ160630.60+542007.5	16 06 30.7 +54 20 07	r24190464a	4.98
5MUSES-174	SDSSJ160655.34+534016.8	16 06 55.4 +53 40 17	r24151040	13.57
5MUSES-175	ELAIS09(R)J160655.8+541500	16 06 55.9 +54 15 01	r24189952	16.22

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Name	NED Name	RA Dec (J2000)	AORKEY	$F_\nu(24\,\mu m)$
5MUSES-176	SDSSJ160730.40+554905.4	16 07 30.4 +55 49 05	r24162560b	5.95
5MUSES-177	2MASXJ16074309+5544161	16 07 43.2 +55 44 17	r24185600b	9.12
5MUSES-178	NPM1G+56.0211	16 08 01.8 +55 53 59	r24162560c	5.88
5MUSES-179	2MASXJ16080364+5453022	16 08 03.8 +54 53 02	r24190464b	4.35
5MUSES-180	ELAIS02(R)J160819.6+553314	16 08 19.6 +55 33 14	r24184064a	6.26
5MUSES-181	ELAIS02(R)J160832.6+552927	16 08 32.7 +55 29 27	r24190720	5.44
5MUSES-182	ELAIS09(R)J160835.6+542329	16 08 35.6 +54 23 30	r24190464c	5.99
5MUSES-183	2MASXJ16083973+5523305	16 08 39.7 +55 23 31	r24181504a	5.00
5MUSES-184	SBS1607+567	16 08 47.0 +56 37 02	r24190208	7.28
5MUSES-185	2MASXJ16085842+5530105	16 08 58.5 +55 30 10	r24184064b	8.54
5MUSES-186	SDSSJ160900.26+563650.2	16 08 58.8 +56 36 36	r24180480a	4.29
5MUSES-187	ELAIS02(R)J160907.6+552428	16 09 07.6 +55 24 28	r24184064c	7.01
5MUSES-188	ELAIS02(R)J160908.3+552241	16 09 08.4 +55 22 41	r24181504b	6.31
5MUSES-189	2MASXJ16092670+5516424	16 09 26.7 +55 16 42	r24181504c	6.53
5MUSES-190	SDSSJ160930.54+563508.8	16 09 30.5 +56 35 08	r24180480b	4.88
5MUSES-191	ELAIS09(R)J160931.5+541827	16 09 31.6 +54 18 28	r24190464d	5.37
5MUSES-192	2MASXJ16093749+5412594	16 09 37.6 +54 12 59	r24190464e	5.14
5MUSES-193	2MASXJ16110373+5443215	16 11 03.9 +54 43 22	r24190464f	5.74
5MUSES-194	ELAIS02(R)J161119.4+553355	16 11 19.4 +55 33 51	r24176896	35.60
5MUSES-195	ELAIS06(R)J161123.4+545158	16 11 23.6 +54 51 58	r24171776a	4.96
5MUSES-196	2MASXJ16122335+5403393	16 12 23.4 +54 03 42	r24189440	12.41
5MUSES-197	2MASXJ16123349+5456309	16 12 33.4 +54 56 30	r24188672a	7.07
5MUSES-198	ELAIS06(R)J161241.0+543956	16 12 41.0 +54 39 56	r24171776b	5.38
5MUSES-199	SDSSJ161249.53+564233.0	16 12 49.6 +56 42 33	r24184832	7.08
5MUSES-200	2MASXJ16125088+5323045	16 12 51.0 +53 23 06	r24187392	17.29
5MUSES-201	SDSSJ161250.96+553546.7	16 12 51.0 +55 35 47	r24167168	10.47
5MUSES-202	2MASXJ16125415+5455261	16 12 54.2 +54 55 26	r24188672b	6.54
5MUSES-203	2MASXJ16130186+5521231	16 13 01.8 +55 21 22	r24166144	35.82
5MUSES-204	ELAIS10S(R)J161357.0+534105	16 13 57.0 +53 41 04	r24175360a	5.98
5MUSES-205	2MASXJ16140306+5607564	16 14 02.9 +56 07 58	r24174848	19.73
5MUSES-206	SDSSJ161405.20+534631.8	16 14 05.3 +53 46 32	r24175360b	5.66
5MUSES-207	ELAISC15J161406.8+551451	16 14 06.9 +55 14 52	r24188672c	8.79
5MUSES-208	SDSSJ161411.52+540554.1	16 14 11.5 +54 05 55	r24175360c	5.73
5MUSES-209	2MASXJ16144902+5545120	16 14 49.1 +55 45 13	r24173056	9.86
5MUSES-210	SBS1614+546	16 15 21.8 +54 31 48	r24171776c	4.82
5MUSES-211	SDSSJ161528.04+534402.4	16 15 28.1 +53 44 02	r24175360d	5.14
5MUSES-212	2MASXJ16154211+5618146	16 15 42.0 +56 18 15	r24151808a	13.69
5MUSES-213	SDSSJ161543.79+554942.5	16 15 43.8 +55 49 43	r24182528a	4.85
5MUSES-214	ELAISC15J161546.5+550331	16 15 46.6 +55 03 31	r24188672d	8.08
5MUSES-215	2MASXJ16154834+5345515	16 15 48.3 +53 45 51	r24183808	5.81
5MUSES-216	ELAISJ161551.3+541536	16 15 51.5 +54 15 36	r24175360e	5.94
5MUSES-217	SDSSJ161644.45+533734.3	16 16 44.5 +53 37 34	r24181248a	7.71
5MUSES-218	SDSSJ161644.68+554638.8	16 16 44.7 +55 46 38	r24182528b	6.07
5MUSES-219	ELAISC15J161645.8+542555	16 16 45.9 +54 25 54	r24171008a	12.03

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Name	NED Name	RA Dec (J2000)	AORKEY	$F_\nu(24\,\mu m)$
5MUSES-220	SDSSJ161655.97+545307.2	16 16 56.0 +54 53 07	r24171776d	4.83
5MUSES-221	2MASXJ16165997+5600276	16 17 00.1 +56 00 27	r24151808b	11.07
5MUSES-222	SDSSJ161712.27+551852.9	16 17 12.3 +55 18 53	r24149248a	6.40
5MUSES-223	SDSSJ161716.58+550920.1	16 17 16.6 +55 09 20	r24188672e	6.88
5MUSES-224	SBS1616+546	16 17 19.0 +54 32 43	r24171008b	14.23
5MUSES-225	SDSSJ161748.06+551830.8	16 17 48.3 +55 18 30	r24149248b	6.60
5MUSES-226	SDSSJ161752.70+540508.5	16 17 52.3 +54 05 10	r24181248b	7.65
5MUSES-227	2MASXJ16175924+5415010	16 17 59.2 +54 15 02	r24163328	23.15
5MUSES-228	SDSSJ161809.35+551522.2	16 18 09.4 +55 15 23	r24149248c	5.99
5MUSES-229	2MASXJ16181934+5418587	16 18 19.2 +54 19 00	r24160512	27.72
5MUSES-230	2MASXJ16182316+5527217	16 18 23.1 +55 27 22	r24160000	24.68
5MUSES-231	SDSSJ161828.72+552210.8	16 18 27.8 +55 22 09	r24180992a	9.14
5MUSES-232	SDSSJ161843.35+554433.3	16 18 43.4 +55 44 33	r24180736a	10.14
5MUSES-233	2MASXJ16184802+5358378	16 18 48.1 +53 58 38	r24181248c	6.73
5MUSES-234	2MASXJ16192963+5418419	16 19 29.4 +54 18 43	r24158720	15.27
5MUSES-235	SDSSJ161950.54+543715.3	16 19 50.6 +54 37 15	r24154368a	6.02
5MUSES-236	SDSSJ161959.37+553338.9	16 19 59.4 +55 33 39	r24149248d	4.94
5MUSES-237	SDSSJ162015.20+543305.4	16 20 15.2 +54 33 05	r24179968	11.42
5MUSES-238	SDSSJ162023.53+550521.5	16 20 23.5 +55 05 22	r24149248e	5.96
5MUSES-239	2MASXJ16203398+5423237	16 20 34.2 +54 23 23	r24154368b	8.46
5MUSES-240	SDSSJ162038.11+553521.3	16 20 38.1 +55 35 21	r24180992b	7.81
5MUSES-241	2MASXJ16205879+5425127	16 20 58.8 +54 25 15	r24162048	18.70
5MUSES-242	2MASXJ16205901+5426017	16 20 59.0 +54 26 02	r24186880	16.92
5MUSES-243	SDSSJ162110.52+544116.7	16 21 10.5 +54 41 17	r24154368c	8.37
5MUSES-244	2MASXJ16212802+5514527	16 21 27.9 +55 14 53	r24149248f	5.25
5MUSES-245	SDSSJ162133.02+551830.0	16 21 33.0 +55 18 30	r24180992c	7.21
5MUSES-246	SDSSJ162148.59+551655.2	16 21 48.6 +55 16 55	r24180736b	10.30
5MUSES-247	2MASXJ16215086+5530091	16 21 50.9 +55 30 08	r24149248g	6.15
5MUSES-248	MCG+09-27-025	16 22 10.9 +55 02 54	r24177664	46.33
5MUSES-249	2MASXJ16220405+5505312	16 22 14.8 +55 06 14	r24180992d	6.54
5MUSES-250	2MASXJ16231310+5511114	16 23 13.1 +55 11 12	r24150016	5.98
5MUSES-251	SDSSJ163001.46+410952.8	16 30 01.5 +41 09 54	r24164608	6.11
5MUSES-252	SDSSJ163111.28+404805.2	16 31 11.3 +40 48 05	r24164096	15.68
5MUSES-253	SDSSJ163128.59+404535.9	16 31 28.6 +40 45 36	r24165120	14.34
5MUSES-254	2MASXJ16322040+4023344	16 32 20.4 +40 23 34	r24161280a	7.22
5MUSES-255	SDSSJ163308.28+403321.4	16 33 08.3 +40 33 21	r24161280b	7.38
5MUSES-256	ELAISC15J163310+405644	16 33 11.0 +40 56 41	r24161792	7.26
5MUSES-257	FIRSTJ163313.2+401338	16 33 13.4 +40 13 40	r24190976	10.02
5MUSES-258	SDSSJ163317.58+403443.5	16 33 17.6 +40 34 43	r24161280c	6.45
5MUSES-259	ELAISC15J163326.5+402606	16 33 26.5 +40 26 08	r24161280d	7.37
5MUSES-260	2MASXJ16333583+4015289	16 33 36.0 +40 15 28	r24155648	29.60
5MUSES-261	2MASXJ16335914+4053048	16 33 59.2 +40 53 04	r24155392a	11.47
5MUSES-262	KUG1632+414	16 34 01.8 +41 20 52	r24155136	46.78
5MUSES-263	SDSSJ163506.06+411038.4	16 35 06.0 +41 10 38	r24155392b	13.87

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Name	NED Name	RA Dec (J2000)	AORKEY	$F_\nu(24\,\mu m)$
5MUSES-264	EMNO8	16 35 41.7 +40 59 00	r24155392c	10.16
5MUSES-265	2MASXJ16354691+4039032	16 35 46.9 +40 39 03	r24156416a	7.17
5MUSES-266	2MASXJ16360811+4105071	16 36 08.4 +41 05 07	r24155392d	12.90
5MUSES-267	2MASXJ16364532+4151337	16 36 45.3 +41 51 33	r24154624a	6.50
5MUSES-268	FIRSTJ163651.6+405559	16 36 51.7 +40 56 00	r24156416b	8.62
5MUSES-269	2MASXJ16370526+4131563	16 37 05.3 +41 31 56	r24160768	10.23
5MUSES-270	FBQSJ163709.3+414030	16 37 09.3 +41 40 31	r24154624b	8.67
5MUSES-271	SDSSJ163715.58+414933.6	16 37 15.6 +41 49 33	r24154624c	8.19
5MUSES-272	2MFGC13321	16 37 29.3 +40 52 48	r24148736	19.33
5MUSES-273	2MASXJ16373133+4051552	16 37 31.4 +40 51 55	r24156416c	6.83
5MUSES-274	SDSSJ163751.24+401439.9	16 37 51.3 +40 14 39	r24161024a	11.55
5MUSES-275	2MASXJ16375130+4130273	16 37 51.4 +41 30 28	r24148480	23.10
5MUSES-276	SDSSJ163751.83+401503.9	16 37 51.8 +40 15 04	r24156416d	8.15
5MUSES-277	2MASXiJ1638022+404653	16 38 02.2 +40 46 54	r24156416e	8.60
5MUSES-278	SDSSJ163805.86+413507.9	16 38 05.9 +41 35 08	r24155904	10.32
5MUSES-279	SDSSJ163808.48+403213.6	16 38 08.6 +40 32 13	r24161024b	12.21
5MUSES-280	2MASXJ16380968+4028449	16 38 09.6 +40 28 45	r24144128	16.21
5MUSES-281	2MASXJ16390614+4040030	16 39 06.2 +40 40 04	r24159744	5.75
5MUSES-282	SDSSJ164019.67+403744.5	16 40 19.7 +40 37 44	r24158976	9.54
5MUSES-283	ELAISC15J164021.5+413925	16 40 21.6 +41 39 25	r24143360a	5.90
5MUSES-284	2MASXJ16404372+4133102	16 40 43.7 +41 33 10	r24143360b	5.41
5MUSES-285	SDSSJ164046.60+412522.5	16 40 46.6 +41 25 22	r24165632	20.02
5MUSES-286	SDSSJ164101.36+411850.6	16 41 01.4 +41 18 50	r24142336	21.05
5MUSES-287	FIRSTJ164115.3+410320	16 41 15.4 +41 03 19	r24143360c	5.18
5MUSES-288	ELAISC15J164135.4+413805	16 41 35.3 +41 38 07	r24143360d	4.87
5MUSES-289	SDSSJ164153.76+405842.6	16 41 53.8 +40 58 45	r24143360e	5.64
5MUSES-290	IRASF16405+4113	16 42 11.9 +41 08 17	r24146944a	11.31
5MUSES-291	SDSSJ164214.40+405129.1	16 42 14.5 +40 51 29	r24146944b	13.98
5MUSES-292	SDSSJ171033.21+584456.8	17 10 33.2 +58 44 56	r24193536a	5.61
5MUSES-293	SDSSJ171124.22+593121.4	17 11 24.2 +59 31 22	r24192768	5.09
5MUSES-294	SDSSJ171232.34+592125.9	17 12 32.5 +59 21 26	r24143872a	7.58
5MUSES-295	SSTXFLSJ171233.3+583610	17 12 33.5 +58 36 11	r24193536b	4.47
5MUSES-296	SDSSJ171233.77+594026.4	17 12 33.8 +59 40 26	r24191488	4.82
5MUSES-297	2MASXJ17131650+5832349	17 13 16.6 +58 32 36	r24193536c	6.18
5MUSES-298	SDSSJ171325.18+590531.1	17 13 25.2 +59 05 31	r24143872b	8.54
5MUSES-299	SDSSJ171414.81+585221.5	17 14 14.9 +58 52 21	r24192256a	8.26
5MUSES-300	SDSSJ171419.98+602724.6	17 14 20.0 +60 27 25	r24191744	5.17
5MUSES-301	SDSSJ171430.76+584225.4	17 14 30.8 +58 42 26	r24192256b	7.52
5MUSES-302	SDSSJ171446.47+593400.1	17 14 46.5 +59 34 00	r24187648a	6.61
5MUSES-303	SSTXFLSJ171447.3+583806	17 14 47.3 +58 38 06	r24193536d	5.27
5MUSES-304	SDSSJ171513.88+594638.1	17 15 13.9 +59 46 38	r24189184a	4.32
5MUSES-305	SDSSJ171544.03+600835.3	17 15 44.1 +60 08 35	r24188928a	6.31
5MUSES-306	2MASXJ17155047+5935486	17 15 50.5 +59 35 49	r24187648b	9.00
5MUSES-307	SDSSJ171614.48+595423.8	17 16 14.5 +59 54 24	r24188160a	8.09

Continued on next page

Table 2 – continued from previous page

Name	NED Name	RA Dec (J2000)	AORKEY	$F_\nu(24\,\mu m)$
5MUSES-308	SDSSJ171630.23+601422.7	17 16 30.3 +60 14 22	r24157696a	7.49
5MUSES-309	SDSSJ171650.58+595751.4	17 16 50.6 +59 57 51	r24188928b	6.59
5MUSES-310	SDSSJ171711.11+602710.0	17 17 11.1 +60 27 10	r24157696b	8.84
5MUSES-311	XFLSCH1J171747.5+593258	17 17 47.6 +59 32 58	r24189184b	4.81
5MUSES-312	SSTXFLSJ171754.6+600913	17 17 54.6 +60 09 13	r24188160b	8.13
5MUSES-313	SDSSJ171852.71+591432.0	17 18 52.7 +59 14 32	r24187904	14.09
5MUSES-314	SDSSJ171913.57+584509.1	17 19 13.6 +58 45 09	r24177920	7.98
5MUSES-315	SDSSJ171933.37+592742.8	17 19 33.4 +59 27 42	r24178688a	7.01
5MUSES-316	2MASXJ17194484+5957071	17 19 44.9 +59 57 08	r24182784	14.97
5MUSES-317	SDSSJ172043.28+584026.6	17 20 43.3 +58 40 27	r24178432	9.05
5MUSES-318	SSTXFLSJ172044.8+582923	17 20 45.2 +58 29 23	r24176640	4.67
5MUSES-319	2MASXJ17215943+5950343	17 21 59.3 +59 50 34	r24178688b	8.81
5MUSES-320	SDSSJ172219.58+594506.9	17 22 19.6 +59 45 07	r24178688c	7.38
5MUSES-321	SDSSJ172228.04+601526.0	17 22 28.1 +60 15 26	r24175872a	6.58
5MUSES-322	SDSSJ172238.73+585107.0	17 22 38.7 +58 51 07	r24163072	6.43
5MUSES-323	SDSSJ172313.06+590533.1	17 23 13.1 +59 05 33	r24187136	5.27
5MUSES-324	SDSSJ172355.58+601301.7	17 23 55.5 +60 13 03	r24172032a	4.79
5MUSES-325	2MASXJ17235597+5940476	17 23 56.0 +59 40 48	r24183552a	4.92
5MUSES-326	SDSSJ172402.11+600601.4	17 24 01.8 +60 06 02	r24175872b	7.00
5MUSES-327	SDSSJ172432.88+592646.9	17 24 32.9 +59 26 47	r24183552b	3.99
5MUSES-328	UGC10859	17 25 46.9 +59 36 55	r24201984	24.45
5MUSES-329	MCG+10-25-031	17 25 51.3 +60 11 39	r24202240	25.27
5MUSES-330	SDSSJ172619.77+601559.9	17 26 19.7 +60 16 00	r24172032b	6.12

References

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