Deep Space Network

108
Ka-Band Radio Source Catalog

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1 Introduction

1.1 Purpose

This module provides a Ka-band (32 GHz) catalog of the angular positions of naturally occurring extra-galactic radio sources which establish a celestial reference frame to be used for interplanetary spacecraft navigation using Delta−Differential One−way Ranging (ΔDOR, Border, 2006) at Ka-band. The catalog is also useful for other applications requiring the precise location of radio sources most notably station locations as well as antenna pointing calibration, antenna arraying, and imaging.

This initial formal release of the Ka-band catalog is driven by the maturing of ΔDOR operations at Ka-band. Ka-band ΔDOR was first demonstrated in 2005 (Shambayati et al, 2006) with the Mars Reconaissance Orbiter (MRO). Today all three space agencies that are engaged in ΔDOR cross-support have Ka-band missions: the National Aeronautics and Space Administration's (NASA) Parker Solar Probe, the European Space Agency's (ESA) Bepi-Columbo, and Japanese Aerospace Exploration Agency's (JAXA) Hayabusa-2. All three of these missions are leveraging Ka-band's superior performance very close to the Sun where Ka-band cuts through solar plasma better than X-band or S-band. Ka-band ΔDOR has come of age.

1.2 Scope

The discussion in this module is limited to describing the contents of the Ka-band source catalog, assessing the accuracy of the positions, and providing a listing of that catalog both within the module and with a link to computer readable versions. The equipment used to collect the data from which the catalog is derived is discussed in module 211 of this handbook. The capabilities of the Deep Space Network (DSN) for performing ΔDOR are contained in module 210.

2 General Information

The angular positions of a set of extragalactic radio sources serve as fiducial points for ΔDOR observations performed by the DSN. This set of point positions is commonly referred to as a *catalog*. The catalog described in this module consists of 680 sources which have been observed in a frequency range that includes the Ka-band deep space allocation specified by the International Telecommunications Union of 31,800 – 32,300 MHz (Hunter, 1979; de Groot 1987). The angular distribution of the radio sources in the catalog is illustrated in Figure 1.

2.1 Desired Accuracy

The DSN goal for Ka-band calls for 0.5 nanoradian (100 µas) accuracy including both random and systematic errors. A stability of 0.05 nrad/year (10 µas/yr) is an implied goal in order to give the

catalog a reasonable lifetime. Note that in the field of astrometry typical units are microarcseconds (µas) where 1.0 nrad = 206 µas. The required spatial density is a source within 6 degrees.

2.2 Catalog Observations and Estimation Strategy

The data used to develop the source catalog were obtained from Ka−band Very Long Baseline Interferometry (VLBI) data with complementary X-band data used to calbrate the Earth's ionosphere and solar plasma. The data were first acquired with the DSN VLBI Subsystem's Mark4 Data Acquisition Terminal recording at 112 Mbps, then from about 2008, the Mark5A at 112 to 448 Mbps and since about 2013 with the DSN VLBI Processor (DVP) at 2048 Mbps. Starting in late 2012, ESA's Deep Space Antenna 3 (DSA 03) located at Malargüe, Argentina was added to the program using the Portable Radio Science Receiver (PRSR) which was upgraded to the Portable Open Loop Receiver (POLR) in 2019. The addition of DSA 03 enabled, for the first time, full sky coverage at Ka-band and in particular coverage of the southern polar cap from declination -45 to -90 degrees.

The angular positions of the radio sources are estimated by a monolithic least−squares fit to the VLBI observables: group delay and phase delay rate. A total of 110,551 delay and delay rate observations were collected in 206 single baseline observing sessions from April 2005 to March 2020 and then correlated. Of these processed observations, 88,173 were used in the final solution to estimate the final source positions. The weighted RMS (wRMS) delay scatter was 43.58 psec; phase delay rate wRMS scatter was 103.85 fsec/sec. About 11,300 parameters were adjusted most of which were to calibrate troposphere changes and instrumental delays. The majority of the 20.2% of the obserations that were not used were deleted because no signal was detected (SNR < 6.5) due to poor pointing at Ka-band and to a lesser extent due to antenna mechanical problems, recorder problems or inherently weak sources. Because the radio catalog monitors about 730 targets per observing day, one must use blind pointing. Time limitations prevent the use of conscan or monopulse techniques for real time pointing refinement. Accordingly, pointing errors due to thermal distortions of the DSN antennas and beamwaveguide mirror misalignments are not corrected. As a result, more than half the data are either not detected or are SNR limited.

Details of the physical modeling required by this procedure are given in (Sovers, Fanselow, & Jacobs, 1998). Estimated parameters included radio source positions, station locations & velocities, station clocks, wet troposphere delays, and troposphere gradients.

NNR: A 3-dimensional "No-Net-Rotation" constraint (Jacobs et al, 2010) was placed on the radio source positions relative to International Celestial Reference Frame 3 (ICRF3) (Charlot, Jacobs, et al, 2020) using a subset of 173 of the 303 defining sources.

TRF: The terrestrial Reference Frame (TRF) estimated station locations for DSS 34, DSS 54, DSS 55, and DSA 03 as linear functions over the time range of the data set with the Goldstone stations DSS 25 and 26 fixed from 2005 until July 2019 in order to provide a No-Net-Translation (NNT) constraint on the terrestrial reference frame. After the July 2019 Ridgecrest earthquake, the positions of DSS 25 and DSS 26 had to be estimated relative to the overseas stations. A priori

station locations and velocities were expressed in the ITRF-1993 system. Similarly, the velocities of the Goldstone stations DSS 25 and DSS 26 were fixed to their apriori ITRF-1993 values in order to provide a No-Net-Velocity (NNV) constraint.

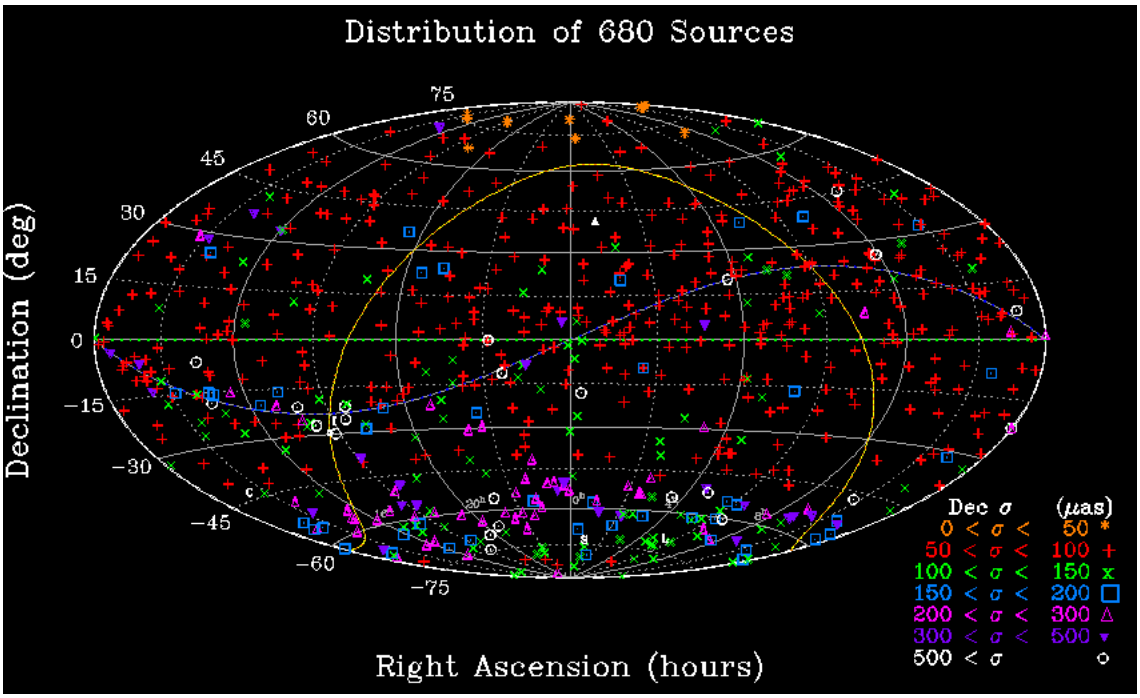
EOP: A No-Net-Rotation constraint was enforced by fixing the earth orientation (UT1-UTC and Polar Motion) to JPL's "Space" series as determined by the JPL Kalman Earth Orientation Function (KEOF) (Ratclif & Gross, 2019). Earth precession and nutation models are taken from MHB-2000 (Mathews, Herring & Buffet, 2002). Time linear corrections to nutations in ecliptic longitude & obliquity, plus a 4 parameter correction to the Free Core Nutation (FCN) with period 431 days were estimated using the MODEST software package (Sovers, Fanselow, Jacobs, 1998).

Station clocks were estimated using a time linear model (offset and rate parameters). Hydrostatic a.k.a. "dry" troposphere delays were fixed to an apriori model based on measured surface pressures (Davis et al, 1985). Wet zenith troposphere delays were estimated at intervals of approximately once per 20 scans (~40 minutes) and then mapped to the elevation of the observation using the Vienna Mapping Function 1 (VMF1) mapping function (Boehm et al, 2006). A mean troposphere gradient was estimated once per station.

2.3 Results

The Ka-band celestial reference frame ("radio catalog") that resulted from the above described data and parameter estimation strategy is listed in Table 3. We are calling this catalog DDOR-2020a-Ka to indicate that it is the first Ka-band catalog constructed for DDOR users in 2020. Figure 1 shows the distribution of sources over the sky using a Hammer-Aitoff equal area plot. There are 680 sources total with fairly uniform spatial density. Median precison is < 100 μas (0.5 nrad). The ecliptic plane is marked as a blue-grey dashed line. The galactic plane is marked by a light yellow-orange line. We note that the southern most part of the ecliptic plane crosses the galactic plane very near the galactic center (α = 17h 45m, δ = -29). This is the most difficult part of the sky to observe because of the scattering by the inter-stellar media (ISM).

Figure 1. Ka-band radio source distribution in Right Ascension & Declination



We compare the rotational alignments and position differences to the ICRF3-SX catalog. Limiting comparison to our 173 (of 303) ICRF3-SX defining sources yields rotational alignments with ~15 µas uncertainty and weighted Root Mean Square (wRMS) differences of 172 µas in Right Ascension (RA or α cosδ) and 149 µas in declination (δ). The differences are dominated by spatially correlated systematic errors (zonal errors).

Table 1. Rotational Alignment Between DDOR-2020a-Ka and ICRF3-SX Catalogues

	173 ICRF3-SX Defining		550 ICRF3-SX Overlapping	
Rotation Axis	Rotation Value (µas)	Rotation Error (µas)	Rotation Value (µas)	Rotation Error (µas)
X	-20.5	9.7	11.0	9.4
Y	-7.9	10.2	-5.4	10.4
Z	-1.1	7.9	27.8	5.5

Table 2. Differenced Positions Between DDOR-2020a-Ka and ICRF3-SX Catalogues

	173 ICRF3 Defining		550 ICRF3- Overlapping	
Differenced Data	Weighted Mean (µas)	Weighted RMS (µas)	Weighted Mean (µas)	Weighted RMS (µas)
RA cos(Dec)	28	172	-4	152
Dec	-132	149	-137	162

Broadening the comparison to include all common sources and after removing 60 outliers of more than 5-sigma, we have 550 common sources. The rotational alignment is better than 30 µas and wRMS differences about the mean of 152 µas in RA cos(dec) and 162 µas in declination (Dec). The Z-rotation is likely biased by the zonal defomations and in particular the quarupole 2,0 term that effects RA.

Source positions were extracted from the MODEST binary output file, "xka.srf," using the “catout” utility and the resulting file, xka.cat_iers, is available from JPL’s Service Preparation Subsystem (SPS) portal.

2.4 Systematic Errors

The celestial frame presented in this document has precision (random measurement error) within the 0.5 nrad goal. However at present, systematic errors consume the entire near term error budget of 1.0 nrad and twice the long term goal of 0.5 nrad leaving the accuracy considerably worse than the precision.

Specifically, the fact that about 85% of the data comes from just two DSN baselines (Goldstone to Tidbinbilla and Goldstone to Madrid) means that the solution is very susceptible to systematic distortion. For example, the solution has difficulty separating tropospheric effects such as average tropospheric gradients from the celestial frame. Because the Goldstone to Tidbinbilla baseline with 10,400 km length is close to an earth diameter, it has anti-correlated elevation angles, that is, on average, high elevation at Goldstone implies low elevation at Tidbinbilla and vice-versa. This prevents the solution from cleanly separating the celestial frame from tropsophere effects. As a result, we see a large quadrupole error in RA:

quadrupole 2, 0 term: $\Delta\alpha \cos(\delta) = (197 +- 21)$ µas $\sin(2\delta)$

The $\sin(2\delta)$ dependence means that northern RAs and southern RAs are based in opposite directions.

The lack of a direct north-south baseline means that declination depend largely on the angled Goldstone-Tidbinbilla baseline which is observed more than 10 times more often than the nearly orthogonal Goldstone-Malargüe baseline which is needed to determine balanced declinations. The resulting geometric weakness is reflected in the uncertainties when estimating a 3-D dipole difference between catalogs: Dipole X and Y have ~15 µas uncertainties whereas dipole-Z has almost 60 µas uncertainty. While the estimated diole-X is not statistically significant, the factor of four (4) larger uncertainty quantifies how weak the declinations are.

Dipole-Z: $\Delta\delta = (-46 +- 57)$ µas $\cos(\delta)$

The process for correcting these errors has been demonstrated. We have Goldstone to Malargüe data. All that is needed is to get more observations on Goldstone to Malargüe to correct the order of magntiude imbalance in observations. In the near future, there may be help from JAXA’s new 54-meter Misasa, Japan station via the Japan to Tidbinbilla, Australia baseline.

2.5 Galactic acceleration

The Solar system orbits the galactic center with roughly a 200 million year period. Just as with the Earth's orbit about the Sun, our orbit around the galactic center creates an aberration effect. Because our orbit is so slow, we absorb most of this nearly constant aberration effect into the reported source positions. However, our acceleration towards the galactic center creates a small, but measureable, change in aberration amounting to 5 μas/year times a projection factor depending on the RA and Dec of the source. The latest International Astronmical Union (IAU) standard (ICRF3, Charlot, Jacobs, et al, 2020) models this drift relative to epoch J2015.0.

For applications with epochs either far from 2015.0 or requiring the highest accuracies, this effect must be considered. For more detailed discussion we refer the reader to MacMillan et al (2019).

2.6 Catalog Format

The catalog uses the J2000 reference epoch and is rotationally aligned with the ICRF3-SX (Charlot, Jacobs et al, 2020) at the ~20 μas level in all components. In addition to the presentation in Table 1, the catalog is available for download as a fixed−width file at:

https://deepspace.jpl.nasa.gov/dsndocs/810-005/108/Ka-catalog-fixed.txt

Lines of the fixed−width file are terminated with ASCII Character 10 (Unix convention). The fixed−width file may be read with the following FORTRAN format statement,

FORMAT (1X, A8, 1X, A12, 1X, I4, 1X, 2(1X,I2), 2X, F11.8, 1X, A1, I2, 1X, I2, 1X, F10.7, Fll.8, F10.7, F8.4, 2F8.1, I6, 2F6.2, F5.1).

2.6.1 B1950 Name (characters 2 through 9)

This is the source name based on its position at the Besselian epoch B1950.0 which is one of the two standard epochs that have been used in the last 40 years for reporting source positions (the other being the Julian epoch J2000.0). The name is related to the position of the source, but is most useful for searching historical databases for information about the source. The name is constructed as follows. The first two digits represent hours of right RA, the next two digits minutes of RA, the fifth place is used to specify the sign of the declination, places 6−7 give degrees of declination, and the last digit gives the first digit of the fractional part of degrees of declination. Thus the first entry in the catalog, 0002-478, is interpreted as a right ascension of zero hours and 2 minutes (of time) and a declination of negative 48.8 degrees at the B1950.0 epoch.

2.6.2 Common Name (characters 11 through 22)

This is the name most commonly used in the literature for the source and is also the name used by the DSN for Delta−DOR measurement scheduling. Often, there is a short prefix that indicates the organization or radio observatory that first documented the source in a survey. The remainder of the name may be related to the source position or an arbitrary sequence number. Some of the prefixes and naming conventions include (Kesteven & Bridle, 1977):

- 3C *nnn* – From the Third Cambridge Catalog. The *nnn* is the numerical designation assigned by the catalog. This survey, originally conducted at 159 MHz, identified many

of the stronger sources used in VLBI. Unfortunately, many of these stronger sources are also less point-like making them less desirable for the highest accuracy astrometric measurements.

- 4C *zz.nn* – From the Fourth Cambridge Catalog. The *zz* corresponds to the declination "zone." The *nn* is a sequential number within the zone. There are no sequential numbers greater than 99.
- B2 *RRrrSDDa* – Most likely from the Second Bologna Survey. The *RRrr* is hours and minutes of right ascension, *S* is the sign of declination and *DD* is degrees of declination. The meaning of a (an alpha character) is unknown.
- CTA *nn* and CTD *nn* – From the California Institute of Technology "A" or "D" surveys where *nn* is the numerical designation assigned by the catalog.
- DW *RRrrSDDd* – From the Dwingelo Radio Observatory (Netherlands) catalog. The *RRrr* is hours and minutes of right ascension, *S* is the sign of declination, *DD* is degrees of declination, and *d* (if present) is the first digit of the fractional part of declination.
- GC *RRrrSDDd* – Most likely names taken from the "General Catalog of 33342 (optical) Stars." The *RRrrSDDd* are as described before.
- HR *nnnn* – Most likely names taken from the "Harvard Revised (optical) Catalog" where *nnn* is the numerical designation assigned by the catalog.
- M *nn* – Most likely names taken from the "Messier Catalog of Galaxies" where *nn* is the numerical designation assigned by the catalog.
- NRAO *nnn* – From the National Radio Observatory catalog where *nnn* is the numerical designation assigned by the catalog.
- O_ *nnn*– From the Ohio State Survey where the second letter indicates the hour of right ascension (two letters are skipped from the alphabet) and *nnn* is a numerical designation assigned by the catalog.
- P *RRrrSDDd* – From the Parkes Radio Observatory (southern Australia) survey. The *RRrrSDDd* are as described before.
- VRO *DD.RR.rr* – From the Vermillion River Observatory (University of Illinois) catalog. The *DD* is degrees declination and *RR* is hours right ascension. The *rr* is unknown but may be either minutes or fractional hours of right ascension.

2.6.3 ID Number (characters 24 through 27)

A unique number, presently in the range of 1 to 4272, is assigned to each radio source for use by programs that identify sources by number instead of name. The correspondence between source name and number will not change when the catalog is updated---except to correct errors. This catalog can be used to establish a unique correspondence between the B1950 or Common Name and ID number. If a source in this catalog is deleted from future revisions of the catalog delivery, its number will be retired. When new sources are added, they will be assigned unique numbers starting with 4273.

2.6.4 Angular Positions (characters 29 through 65)

Background: When the IAU's fundamental reference frame transitioned from the optically based catalog of galactic stars, FK5 (Fricke et al, 1988), to the catalog of extragalactic Active Galactic

Nuclei (AGNs) on 1 January 1998 (IAU, 1998; Ma et al 1998), right ascension, and most importantly the origin of RA, transitioned by conventional agreement to values based on the RA of the extragalactic radio sources. In practice at the time of this documents prepration, this means that the axes implicitly defined by a set of source positions must agree with the ICRF3-SX (Charlot, Jacobs et al, 2020) to within the formal uncertainty of the ICRF3-SX axes or approximately 10 μas (1 standard deviation). Thus, the orientation of the celestial frame axes may vary in future realizations by roughly that amount.

Angular positions are specified by a pair of angular coordinates: RA and DEC. Note that while in the pre-ICRF era (pre-1998) right ascension used to be defined as the angular distance along the celestial equator from the intersection of the equator and the ecliptic, since 01 Jan 1998 this is no longer strictly true. The ICRF-1 (Ma et al, 1998) was aligned to the FK5 optical frame within the errors of the FK5 to better than 100 milli-arcseconds. Thus, once one becomes concerned with accuracy levels < 100 milliarcseconds (500 nrad) as we are in this document, the differences between the old equator and ecliptic system and the new extra-glactic system are significant and must be accounted for.

The Ka-band coordinates reported in this module 108 are consistent with the new extagalactic ICRF-1 system (Ma et al, 1998) defined by the IAU as of 01 Jan 1998 (IAU, 1997) and refined with the release of the ICRF-2 (IAU, 2009; Ma et al, 2009) and ICRF-3 (IAU, 2018; Charlot, Jacobs et al, 2020).

2.6.4.1 Right Ascension (characters 29 through 47)

Right ascension is presented in the form " *hh mm SS.ssssssss*" where the first sub field gives hours of RA, followed by (time) minutes of RA, and (time) seconds of RA to eight decimal places.

2.6.4.2 Declination (characters 49 through 65)

Declination is presented in the form "*Sdd mm SS.sssssss*" where first sub−field, S or column 49, gives the sign of declination (a blank is allowed and should be interpreted as a positive declination). The remaining subfields give angular declination in degrees, minutes, and seconds to seven decimal places.

Warning regarding sign convention: Note that a minus sign applies to the whole declination (*dd mm SS.sssssss*). For example, a declination of –00 00 00.*sssssss* should be read as minus 0.*sssssss* arcseconds of declination. This means that users desiring decimal representations of declination must first convert from degrees, minutes, seconds format to decimal format before applying the relevant sign. To simplify this conversion, the sign is in a fixed position in the fixed−width file.

2.6.5 Right Ascension Error (characters 66 through 76)

This field provides the formal one standard deviation right ascension uncertainty in units of seconds of time.

2.6.6 Declination Error (characters 77 through 86)

This field provides the formal one standard deviation declination uncertainty in units of arcseconds of angle.

2.6.7 Correlation of Right Ascension and Declination (characters 87 through 94)

This field provides the formal correlation of right ascension and declination. The quantity may range from –1.0 to +1.0 and a blank in front of the value should be interpreted as indicating a positive correlation. Values near zero indicate that the principal axes of the error ellipse are close to the RA−Dec axes. The large number of negative correlations is, in part, due to the large influence of the California to Australia baseline (typically between DSS−25,26 and DSS−34) on determination of declination.

2.6.8 Observation Epochs (characters 95 through 110)

Epochs are referred to Modified Julian Day (MJD) and are typically on the order of 50000 days.

The relation with Julian Date is given by

MJD = 2400000.5 –JD

or

MJD(t=J2000) = 51543

2.6.8.1 Initial (characters 95 through 102)

The earliest epoch of the first observation.

2.6.8.2 Last (characters 103 through 110)

The termination epoch of the most recent observation.

2.6.9 Number of Sessions (characters 111 through 116)

The number of sessions, where a session is defined as a continuous data collection period, may be used as a rough indicator of the robustness of the position determination. Any position based on less than 3 sessions should be considered provisional.

2.6.10 Correlated Flux Density (characters 117 through 128)

The correlated flux density reported is an estimate of the median correlated flux density for observations of the radio source using DSN baselines Goldstone−Madrid and Goldstone−Canberra. These median correlated flux density values are reported for each baseline when available. This value, in Janskys (Jy = 1.e-26 watts/m^2/Hz), is computed from the measured signal−to−noise ratio (SNR) ouput by the quasar fringe fitting program using the following formula.

$$Flux = SNR * \frac{1}{K_l} * \frac{2k}{10^{-26}} * \frac{4\pi}{\lambda^2} * \frac{1}{\sqrt{\left(\frac{G}{T}\right)_1 \left(\frac{G}{T}\right)_2}} * \frac{1}{\sqrt{DT_{QU}}}$$

Where K_L is the system loss factor (1.0), k is the Stefan-Boltzman constant (1.38x10^{-23} J/K), λ is the wavelength of the signal, G/T is the antenna gain over system temperature parameter for antenna 1 and 2, D is the total sampling rate, and T_{QU} is the quasar integration time. Most of these parameters are recording in the output of the Cfit fringe fitting program, but the G/T values for

each antenna are estimated using the elevation angles and the appropriate equations from the 810-005 module 101-G for the 70m antennas (Slobin, 2019), module 103-C for the 34m HEF antennas (Slobin, 2014), and module 104-L 34m BWG antennas (Slobin, 2019).

Loss factor, K_L, is for the moment set to unity. As a result various losses are absorbed into the report flux densities in Table 3. Of particular concern is the loss from pointing errors which may be in the range of 5 to 10 milli-degrees or 1 to 4 dB (Slobin, module 104-L, fig. 49). The beam waveguide antenna design and calibration does not account for antenna deformation due to thermal changes in the structure. These may be as large a 1 milli-degree per deg C. Given that pointing calibrations are done at night, one might expect up to 10 milli-deg pointing errors (4 dB) during the heat of the day. Mirror mislaignment is another concern. For example, in the first half of 2017, DSS 55 had large mirror misalignments that greatly reduced the Ka-band signal levels.

The fluxe densities presented here are intended to guide DDOR source selection by providing meaningful realtive fluxes. However, the absolute flux scale has not been determined and may be in error by a factor of 2 to 4. The absolute scale could be determined to about 20% if needed and if sufficent resources were to be allocated to the task.

The SNR is determined during the cross−correlation and fringe fitting of actual radio source observations. Only DDOR, TEMPO, and CAT M&E observations from the last 5 years (2015-2020) were used in computing the median SNR which went into the flux calculation. If no observations of a radio source on DSN baselines since 2015 are available, no value is provided for correlated flux. Note that only 3 sources, all of which are near the galactic center (α=17h 45m, δ= -29 deg), have not been detected since 2015.0.

Independent values for the correlated flux density are reported for the California−Madrid and the California−Canberra DSN baselines. These columns necessarily represent only a subset of the sources since each baseline can access only about 2/3 of the sky. Also note that the format defined for this document does not include baselines to the ESA antennas at Malargüe, Argentina. As a result, sources below declination -45 deg which are observable only on the Tidbinbilla, Australia to Argentina baseline are not tabulated, but these fluxes do exist and can be provided upon request.

As an example, a typical DSN observation may use the following parameter values: G/T = 64.5 dB-K (typical 34m BWG performance), D = 704 Msamples/sec (11 channels of 32 MHz complex bandwidth), and T = 60 seconds. If the minimum accceptable detection is for SNR > 6.5, the weakest quasars that can be detected in these observations are on the order of 5 mJy.

2.6.10.1 Correlated Flux Density Madrid Baseline (characters 117 through 122)

This is the realtive correlated flux density for quasars observed on the Goldstone-Madrid (10-60) baseline. Flux densities on this baseline are available for 438 of 680 of the sources in Table 1. The absolute flux density scale is likely uncertain by a factor of 2 to 4.

2.6.10.2 Correlated Flux Density Canberra Baseline (characters 123 through 128)

This is the relative correlated flux density for quasars observed using the Goldstone-Canberra (10-40) baseline. Flux densities on this baseline are available for 462 of 680 of the sources in Table 1. The absolute flux density scale is likely uncertain by a factor of 2 to 4.

2.6.11 Structure Index (characters 129 through 133)

The structure index is determined through the following relationship between the radio source structure index and the median value of the VLBI structure group delay corrections (Ma et al, 2009):

$$\mathrm{SI} = 1 + 2\log(\tau_{median})$$

where SI is the structure index, and τ_{median} is the median value of the structure delay corrections in picoseconds (ps). A value for τ_{median} in the range of 0 to 40 ps is typical for a source that is point−like. A value in the range of 40 to 60 ps is typical for a source that has significant structure. The source structure itself may contribute an error of this magnitude to the delay error budget. Values of the delay scatter greater than 60 ps are typical for sources with large, extended, and possibly variable structure.

Table 3 presents K-band (24 GHz)---not Ka-band (32 GHz)---estimates of the structure index for a fraction of the sources because no maps at Ka-band exist with which to make Ka-band structure index estimates.

The actual Ka-band τ_{median} values are likely a factor of 1.5 smaller (better) than the K-band proxy measurements of τ_{median} tablualted below. In fact, one of the key benefits of observing at Ka-band should be the reduction in source structure.

The K-band (24 GHz) estimates of the structure index for a few hundred sources are from Charlot et al (2010). De Witt et al (2020, in prep.) are preparing to publish K-band images of over 700 sources which should enable better proxy structure indices to be calculated for the next release of this module.

Table 3. Ka-Band Radio Source Catalog: DDOR_2020a-Ka

Source Name		ID No.	Right Ascension			Declination			RA Error (s)	Dec. Error (arcsec)	RA–Dec Corr.	Observation Epoch MJD		No. Obs.	Source Flux (Jy)		K Struct Index
B1950	Common		H	M	S	D	M	S				First	Last		10-60	10-40	
0002-478	0002-478	706	00	04	35.65546157	-47	36	19.6046298	0.00001248	0.0001342	-0.4744	56297.6	58810.2	29		0.09	
0002+541	0002+541	2284	00	05	4.36335936	+54	28	24.9241233	0.00000740	0.0000990	0.2360	55304.5	58874.6	43	0.04		
0003+380	GC 0003+38	1	00	05	57.17539933	+38	20	15.1489523	0.00000430	0.0000719	-0.2596	53561.7	58937.1	114	0.09	0.11	
0003-066	0003-066	696	00	06	13.89286699	-06	23	35.3350922	0.00000547	0.0001147	-0.5643	53561.6	58937.0	120	0.38	0.27	
0006+061	0006+061	2296	00	09	3.93183234	+06	28	21.2400466	0.00000547	0.0001068	-0.6119	53651.5	58938.0	105	0.02	0.03	1.51
0007+106	III ZW 2	986	00	10	31.00589912	+10	58	29.5044219	0.00000346	0.0000798	-0.4790	53694.3	58938.0	144	0.07	0.12	1.15
0008-264	P 0008-264	7	00	11	1.24672037	-26	12	33.3773903	0.00000757	0.0001089	-0.6807	53561.7	58937.9	83	0.15	0.10	
0009+081	0009+081	1253	00	11	35.26959838	+08	23	55.5861777	0.00000447	0.0000944	-0.5484	53694.3	58938.0	98	0.04	0.06	2.14
0010-401	0010-401	2305	00	12	59.90980804	-39	54	26.0560627	0.00000912	0.0001020	-0.5356	55451.4	58937.9	71		0.07	
0013-184	0013-184	2312	00	15	34.32452131	-18	07	25.5852007	0.00006340	0.0008559	-0.9802	56746.9	58839.2	28		0.02	
0013-005	P 0013-00	666	00	16	11.08854117	-00	15	12.4453015	0.00000474	0.0001032	-0.6470	53561.7	58937.9	96	0.07	0.06	
0017+200	0017+200	987	00	19	37.85450011	+20	21	45.6444550	0.00000371	0.0000769	-0.4231	53609.5	58937.9	130	0.13	0.15	2.1
0017+257	0017+257	988	00	19	39.78060744	+26	02	52.2769820	0.00000414	0.0000857	-0.4483	55304.6	58937.9	99	0.09	0.05	
0016+731	0016+731	710	00	19	45.78639981	+73	27	30.0175400	0.00001099	0.0000461	0.0930	53568.0	58874.5	81	0.37		0.87
0019+058	P 0019+058	11	00	22	32.44120798	+06	08	4.2687902	0.00000359	0.0000823	-0.4987	53561.7	58895.2	139	0.08	0.10	1.4
0021-686	0021-686	4144	00	24	6.72292449	-68	20	54.5874650	0.00002821	0.0001563	-0.1121	56297.6	58643.9	15			
0038-020	0038-020	2347	00	40	57.61155924	-01	46	32.0258365	0.00000446	0.0000934	-0.6069	53609.6	58937.0	111	0.06	0.11	1.68
0044-846	0044-846	4145	00	44	26.68913098	-84	22	39.9875867	0.00007451	0.0001279	0.1249	56297.5	58643.9	15			
0044+030	0044+030	4146	00	47	5.91872592	+03	19	54.7856439	0.00000401	0.0000941	-0.5622	56892.5	58895.2	72	0.10	0.08	
0046+316	NGC 0262	996	00	48	47.14149773	+31	57	25.0847844	0.00000399	0.0000795	-0.3363	53687.1	58937.1	125	0.10	0.04	1.65
0047+023	J0049+0237	997	00	49	43.23593371	+02	37	3.7785348	0.00000366	0.0000851	-0.5161	55262.7	58895.2	110	0.10	0.10	
0047-579	P 0047-579	714	00	49	59.47303069	-57	38	27.3400805	0.00001634	0.0001934	-0.0647	56275.6	58643.9	15			
0048-097	P 0048-09	19	00	50	41.31735959	-09	29	5.2104361	0.00000392	0.0000855	-0.5018	53561.6	58937.0	148	0.07	0.08	
0054+161	0054+161	1254	00	56	55.29433059	+16	25	13.3408701	0.00000345	0.0000783	-0.4116	53609.5	58937.9	134	0.11	0.09	0.81
0055+060	0055+060	1340	00	58	33.80456871	+06	20	6.0734535	0.00000362	0.0000844	-0.4926	55262.7	58937.0	114	0.11	0.06	
0056-572	0056-572	715	00	58	46.58113436	-56	59	11.4702457	0.00001190	0.0002116	-0.2485	56297.7	58643.8	15			
0101-804	0101-804	4147	01	02	14.91173561	-80	12	39.4310762	0.00005570	0.0001185	0.0571	56297.5	58643.9	13			
0100-760	0100-760	4148	01	02	18.66007412	-75	46	51.7307496	0.00002630	0.0001168	-0.1375	56275.7	58643.8	17			
0059+581	0059+581	716	01	02	45.76240562	+58	24	11.1364321	0.00000579	0.0000549	0.1539	53568.0	58874.7	83	0.56		0.55
0104-408	P 0104-408	25	01	06	45.10794604	-40	34	19.9608603	0.00000746	0.0000914	-0.4630	53561.5	58937.9	100		0.38	1.86
0106+013	P 0106+01	27	01	08	38.77110178	+01	35	0.3170942	0.00000298	0.0000756	-0.3721	53561.6	58938.0	139	0.44	0.39	
0107-610	0107-610	1255	01	09	15.47517783	-60	49	48.4598105	0.00002119	0.0003656	-0.2775	56394.8	58643.9	10			
0106+315	0106+315	4049	01	09	27.88718695	+31	49	56.0492429	0.00000564	0.0001366	-0.3573	56892.7	58937.1	63	0.04	0.02	
0109+224	GC 0109+22	30	01	12	5.82471996	+22	44	38.7862866	0.00000356	0.0000754	-0.3891	53644.3	58937.1	136	0.14	0.14	1.29
0109+200	0109+200	4149	01	12	10.19081418	+20	20	21.7640844	0.00000751	0.0001551	-0.6120	56738.7	58895.1	53	0.02	0.02	
0109+351	0109+351	2383	01	12	12.94440756	+35	22	19.3362535	0.00000438	0.0000822	-0.3458	55304.6	58937.1	103	0.07	0.05	
0110+495	0110+495	717	01	13	27.00682390	+49	48	24.0431670	0.00000495	0.0000757	0.1689	53568.4	58874.7	71	0.16		1.85
0111+021	P 0111+021	32	01	13	43.14494010	+02	22	17.3161839	0.00000436	0.0000897	-0.6254	53561.6	58937.9	132	0.05	0.12	2.34
0112-017	P 0112-017	33	01	15	17.09989768	-01	27	4.5771740	0.00000391	0.0000847	-0.5519	53561.7	58938.0	117	0.10	0.14	
0113-118	P 0113-118	34	01	16	12.52200868	-11	36	15.4347745	0.00000378	0.0000836	-0.4812	53561.6	58937.9	123	0.27	0.31	
0115-214	0115-214	1352	01	17	48.78010739	-21	11	6.6333271	0.00000521	0.0000912	-0.5281	55178.2	58937.9	90	0.05	0.12	
0119+115	P 0119+11	38	01	21	41.59504004	+11	49	50.4127543	0.00000330	0.0000778	-0.4311	53561.7	58937.9	140	0.13	0.09	
0119+041	GC 0119+04	667	01	21	56.86169306	+04	22	24.7340819	0.00000359	0.0000802	-0.5089	53561.7	58937.1	139	0.08	0.16	2.63
0119+247	0119+247	1210	01	22	38.81598971	+25	02	31.7924487	0.00000451	0.0000908	-0.4798	53644.2	58937.1	97	0.05	0.03	2.41
0122-003	0122-003	1256	01	25	28.84383312	-00	05	55.9315212	0.00000405	0.0000931	-0.5816	53609.6	58937.0	114	0.09	0.09	2.85
0123+257	P 0123+25	40	01	26	42.79264315	+25	59	1.3000968	0.00000367	0.0000773	-0.3691	53644.3	58937.1	122	0.21	0.12	
0127+084	0127+084	719	01	30	27.63443257	+08	42	46.1717540	0.00000392	0.0000867	-0.5307	55262.7	58937.1	98	0.08	0.06	0.9

Source Name		ID No.	Right Ascension			Declination			RA Error (s)	Dec. Error (arcsec)	RA–Dec Corr.	Observation Epoch MJD		No. Obs.	Source Flux (Jy)		K Struct Index
B1950	Common		H	M	S	D	M	S				First	Last		10-60	10-40	
0131-795	0131-795	4150	01	31	48.82274948	-79	16	17.4854900	0.00005351	0.0001736	0.1760	56275.7	58643.4	17			
0133+476	DA 55	44	01	36	58.59483132	+47	51	29.1000041	0.00000435	0.0000701	0.1115	53568.3	58874.1	82	0.47		
0138-097	0138-097	722	01	41	25.83215062	-09	28	43.6743122	0.00000353	0.0000801	-0.4249	53644.2	58937.0	143	0.19	0.14	2.38
0139-097	J0141-0930	4151	01	41	37.93973951	-09	30	1.7863903	0.00001005	0.0001676	-0.7714	56510.4	58937.0	61	0.02	0.02	
0146+056	0146+056	668	01	49	22.37095332	+05	55	53.5680378	0.00000453	0.0000956	-0.5273	54967.6	58937.1	93	0.03	0.03	
0148-177	0148-177	2427	01	51	6.08334334	-17	32	44.7184790	0.00000486	0.0000938	-0.5371	55178.2	58937.9	100	0.05	0.06	
0149+218	P 0149+21	53	01	52	18.05904450	+22	07	7.6997027	0.00000329	0.0000706	-0.3513	53561.7	58937.1	150	0.27	0.25	
0152-513	0152-513	4152	01	54	19.69616630	-51	07	51.7280163	0.00001717	0.0003015	-0.0171	56394.7	58643.8	13			
0159-668	0159-668	4153	02	01	7.74395563	-66	38	12.6666527	0.00002179	0.0001610	0.1276	56275.7	58643.4	15			
0201+113	P 0201+113	57	02	03	46.65705136	+11	34	45.4093512	0.00000421	0.0000919	-0.5261	53561.7	58937.1	112	0.07	0.05	
0202+149	P 0202+14	58	02	04	50.41390675	+15	14	11.0431089	0.00000350	0.0000758	-0.4462	53561.8	58937.1	143	0.15	0.13	
0202+319	DW 0202+31	59	02	05	4.92537742	+32	12	30.0952957	0.00000347	0.0000677	-0.2369	53561.8	58937.1	154	0.28	0.18	0.39
0203-120	0203-120	2451	02	06	26.08472159	-11	50	39.7249360	0.00000410	0.0000868	-0.4852	55262.8	58937.0	111	0.08	0.09	
0206-625	0206-625	4154	02	08	1.17102399	-62	16	35.5342662	0.00006099	0.0003218	0.1139	56395.6	58643.8	11			
0212-620	0212-620	4053	02	14	16.20425795	-61	49	33.6595753	0.00001384	0.0001526	-0.1765	56297.7	58643.9	16			
0213-026	0213-026	2468	02	15	42.01728995	-02	22	56.7527618	0.00000427	0.0000989	-0.4763	53728.0	58937.0	103	0.05	0.03	2.45
0219+428	0219+428	728	02	22	39.61151114	+43	02	7.7986790	0.00000453	0.0000699	-0.1266	53561.8	58937.1	117	0.10	0.10	
0220-349	P 0220-349	729	02	22	56.40162145	-34	41	28.7306175	0.00001075	0.0001127	-0.6682	53609.5	58937.9	76		0.06	3.1
0221-540	0221-540	4155	02	23	30.87476807	-53	47	39.9013463	0.00001459	0.0002073	-0.0014	56394.8	58643.7	14			
0221+067	GC 0221+06	67	02	24	28.42819762	+06	59	23.3413928	0.00000324	0.0000728	-0.4247	53561.8	58937.1	144	0.15	0.33	2.14
0224+671	DW 0224+67	68	02	28	50.05151036	+67	21	3.0292481	0.00000846	0.0000535	0.1705	53568.3	58874.5	77	0.21		2.61
0227-542	0227-542	4156	02	29	12.78529469	-54	03	24.0349468	0.00001729	0.0002177	0.1841	56394.8	58643.9	14			
0229-479	0229-479	4157	02	31	11.80401034	-47	46	11.5836076	0.00001038	0.0002676	0.1677	56394.8	58643.9	13			
0229+131	P 0229+13	69	02	31	45.89404008	+13	22	54.7159992	0.00000318	0.0000718	-0.4139	53561.7	58937.1	151	0.16	0.13	
0229-398	0229-398	2492	02	31	51.81628107	-39	35	47.2635768	0.00001172	0.0001319	-0.5216	56313.1	58860.2	58		0.03	
0235-618	0235-618	1011	02	36	53.24571052	-61	36	15.1835695	0.00001452	0.0001482	0.1734	56275.6	58643.5	17			
0234+285	CTD 20	71	02	37	52.40568769	+28	48	8.9897831	0.00000321	0.0000664	-0.2777	53561.8	58937.1	162	0.58	0.18	2.56
0235+164	GC 0235+16	72	02	38	38.93011197	+16	36	59.2744350	0.00000310	0.0000701	-0.3831	53561.7	58937.1	153	0.41	0.30	1.13
0237-027	P 0237-027	73	02	39	45.47227286	-02	34	40.9146904	0.00000378	0.0000842	-0.5383	53561.7	58937.0	152	0.05	0.19	1.7
0237+040	GC 0237+04	74	02	39	51.26304639	+04	16	21.4115438	0.00000335	0.0000768	-0.4834	53561.7	58937.1	143	0.12	0.17	
0239+108	OD 166	77	02	42	29.17084955	+11	01	0.7277746	0.00000355	0.0000781	-0.4742	53561.8	58937.1	135	0.07	0.08	1.94
0244-470	0244-470	4158	02	46	0.11793730	-46	51	17.2333144	0.00000821	0.0000978	-0.2424	56297.7	58860.2	47		0.13	
0245-167	0245-167	2506	02	48	7.73221893	-16	31	46.3860237	0.00000481	0.0000972	-0.5579	55451.5	58937.0	103	0.08	0.06	
0248-266	0248-266	1426	02	50	35.56918112	-26	27	42.5159663	0.00000815	0.0001185	-0.6546	56031.9	58937.0	70		0.03	
0252-549	P 0252-549	734	02	53	29.18037592	-54	41	51.4363733	0.00000980	0.0001341	0.2872	56275.7	58643.9	17			
0250+320	0250+320	1427	02	53	33.65015652	+32	17	20.8919645	0.00000392	0.0000747	-0.3159	53644.3	58937.1	136	0.13	0.08	0.56
0256-005	0256-005	2520	02	59	28.51616314	-00	19	59.9756957	0.00000431	0.0000989	-0.6063	55304.7	58937.1	96	0.07	0.04	
0256+192	0256+192	1432	02	59	29.65594699	+19	25	44.3274980	0.00000404	0.0000812	-0.4885	53603.5	58937.1	121	0.07	0.08	1.46
0301-721	0301-721	4159	03	01	38.44578198	-71	56	34.3997007	0.00002594	0.0001069	-0.0594	56297.7	58643.9	16			
0300+470	OE 400	82	03	03	35.24224138	+47	16	16.2754615	0.00000451	0.0000650	0.0404	53644.2	58895.3	103	0.33	0.37	1.86
0302-623	P 0302-623	735	03	03	50.63134990	-62	11	25.5506006	0.00002171	0.0001798	0.2632	56275.6	58643.4	14			
0303+051	0303+051	2527	03	05	48.19160066	+05	23	31.5268616	0.00002371	0.0005002	-0.7418	56802.0	58873.9	20	0.01	0.01	
0306+102	0306+102	671	03	09	3.62350034	+10	29	16.3407275	0.00000308	0.0000713	-0.4167	53561.7	58937.1	149	0.42	0.37	1.92
0309+411	0309+411	672	03	13	1.96214453	+41	20	1.1832126	0.00000446	0.0000658	-0.2370	54001.6	58937.1	129	0.08	0.28	2.24
0322-294	0322-294	2546	03	24	44.29538825	-29	18	21.2181531	0.00002392	0.0002707	-0.9356	57985.5	58937.0	16		0.08	
0322+222	0322+222	1017	03	25	36.81436155	+22	24	0.3654321	0.00000351	0.0000716	-0.4130	53561.8	58937.1	135	0.29	0.29	1.01
0326+277	0326+277	673	03	29	57.66940239	+27	56	15.4993466	0.00000495	0.0000868	-0.5233	54450.0	58937.1	94	0.04	0.07	
0332-403	P 0332-403	93	03	34	13.65446339	-40	08	25.3983950	0.00000642	0.0000856	-0.3573	53561.6	58937.9	87		0.22	
0332+078	0332+078	1449	03	34	53.31669458	+08	00	14.4188573	0.00000419	0.0000843	-0.5548	55304.8	58937.2	113	0.05	0.06	
0334-546	0334-546	740	03	35	53.92481667	-54	30	25.1151007	0.00004777	0.0009482	0.2741	57272.7	58643.9	5			

Source Name		ID No.	Right Ascension			Declination			RA Error (s)	Dec. Error (arcsec)	RA–Dec Corr.	Observation Epoch MJD		No. Obs.	Source Flux (Jy)		K Struct Index
B1950	Common		H	M	S	D	M	S				First	Last		10-60	10-40	
0333+321	NRAO 140	94	03	36	30.10761408	+32	18	29.3420263	0.00000393	0.0000699	-0.3629	53644.2	58937.1	136	0.23	0.26	1.85
0334-131	0334-131	2559	03	36	35.03580596	-13	02	4.6599907	0.00000488	0.0000937	-0.5318	55227.9	58937.0	102	0.05	0.05	
0336-019	CTA 26	95	03	39	30.93778443	-01	46	35.8043042	0.00000309	0.0000725	-0.4068	53561.7	58937.1	161	0.31	0.33	2.67
0340+362	J0343+3622	1019	03	43	28.95242002	+36	22	12.4295319	0.00000535	0.0000932	-0.2874	53644.2	58937.1	97	0.03	0.03	1.19
0339+683	0339+683	1452	03	44	41.44123389	+68	27	47.8100967	0.00001322	0.0000632	-0.0756	56053.3	58874.2	43	0.04		
0342+147	0342+147	674	03	45	6.41652851	+14	53	49.5580505	0.00000412	0.0000797	-0.5408	53561.8	58937.1	121	0.04	0.08	
0344+199	0344+199	2570	03	47	29.63783493	+20	04	52.0964605	0.00367871	0.0414527	-0.9981	58895.3	58895.3	1		0.02	
0346-279	0346-279	1259	03	48	38.14454707	-27	49	13.5660595	0.00000513	0.0000862	-0.4419	53609.7	58937.0	98		0.38	2.15
0345+460	0345+460	1213	03	49	18.74159454	+46	09	59.6577441	0.00000539	0.0000741	-0.1659	53644.3	58874.2	102	0.06	0.09	1.96
0350+465	0350+465	1260	03	54	30.01167679	+46	43	18.7497920	0.00000505	0.0000769	0.0800	53644.2	58874.2	102	0.06	0.06	1.75
0346+800	0346+800A	1214	03	54	46.12605518	+80	09	28.8473450	0.00002266	0.0000620	-0.0507	55304.7	58874.5	51	0.04		
0354+231	0354+231	1022	03	57	21.60989896	+23	19	53.8251776	0.00000365	0.0000735	-0.4235	53644.3	58937.1	132	0.15	0.16	0.87
0358+040	0358+040	1262	04	01	19.91297328	+04	13	34.4069431	0.00000317	0.0000731	-0.4315	53609.6	58937.2	150	0.19	0.17	0.56
0358+210	J0401+2110	1024	04	01	45.16609103	+21	10	28.5867176	0.00000445	0.0000905	-0.5147	53561.8	58937.1	115	0.05	0.04	1.07
0400+258	CTD 26	100	04	03	5.58609368	+26	00	1.5025808	0.00000467	0.0000888	-0.4374	53644.3	58937.1	117	0.04	0.04	1.96
0402-362	P 0402-362	102	04	03	53.74987985	-36	05	1.9135850	0.00000517	0.0000833	-0.3267	53561.7	58937.0	95		0.46	0
0403-132	P 0403-13	103	04	05	34.00337938	-13	08	13.6910559	0.00000382	0.0000825	-0.4492	53561.7	58937.0	110	0.19	0.13	
0405-385	P 0405-385	104	04	06	59.03532675	-38	26	28.0425146	0.00000612	0.0000857	-0.3420	53609.6	58937.0	92		0.19	2.2
0405-331	0405-331	2592	04	07	33.91371201	-33	03	46.3583648	0.00000756	0.0001022	-0.5652	53609.6	58937.0	81		0.06	1.16
0405-123	P 0405-12	105	04	07	48.43097367	-12	11	36.6595566	0.00000398	0.0000857	-0.4601	54966.7	58937.2	106	0.13	0.06	
0406-127	0406-127	749	04	09	5.76971491	-12	38	48.1439350	0.00000674	0.0001273	-0.5816	53561.9	58937.2	84	0.04	0.03	
0406+121	GC 0406+12	107	04	09	22.00870493	+12	17	39.8476878	0.00000572	0.0001040	-0.6497	53561.8	58937.2	111	0.02	0.03	1.98
0409+229	P 0409+22	109	04	12	43.66688534	+23	05	5.4522237	0.00000490	0.0000890	-0.5791	55304.7	58895.3	102	0.04	0.06	
0414-189	P 0414-189	112	04	16	36.54443575	-18	51	8.3403888	0.00000458	0.0000858	-0.4704	55228.0	58937.0	95	0.06	0.09	
0415+398	0415+398	1465	04	19	22.54953709	+39	55	28.9775296	0.00000488	0.0000756	-0.3520	53644.3	58937.3	111	0.06	0.09	2.08
0420+022	0420+022	1263	04	22	52.21465201	+02	19	26.9305986	0.00000382	0.0000809	-0.5278	53609.7	58937.1	142	0.04	0.06	
0420-014	P 0420-01	116	04	23	15.80071895	-01	20	33.0658128	0.00000289	0.0000699	-0.3688	53561.8	58937.0	168	0.76	0.49	
0420+417	VRO 41.04.01	115	04	23	56.00981742	+41	50	2.7129955	0.00000437	0.0000640	-0.1466	53561.0	58937.3	119	0.21	0.20	
0422-380	0422-380	750	04	24	42.24368116	-37	56	20.7848082	0.00000577	0.0000848	-0.3461	53609.6	58937.0	93		0.17	2.88
0422+004	P 0422+00	118	04	24	46.84205557	+00	36	6.3292229	0.00000344	0.0000856	-0.4382	53568.6	58937.2	151	0.10	0.04	
0425+048	P 0425+048	121	04	27	47.57053896	+04	57	8.3252206	0.00000364	0.0000790	-0.4761	53561.9	58937.1	134	0.08	0.07	1.72
0426-380	P 0426-380	122	04	28	40.42424822	-37	56	19.5811386	0.00000502	0.0000824	-0.3016	53609.5	58937.0	94		0.73	1.64
0427-502	0427-502	4160	04	28	42.63217427	-50	05	34.2949475	0.00001501	0.0003999	0.1059	56394.5	58643.9	12			
0426+273	0426+273	751	04	29	52.96078156	+27	24	37.8762080	0.00000570	0.0001318	-0.4551	53561.8	58937.3	91	0.02	0.02	0.92
0430-332	0430-332	2627	04	32	44.56421102	-33	09	11.9313408	0.00001066	0.0001315	-0.6546	55451.5	58937.0	61		0.03	
0430+052	3C 120	125	04	33	11.09557155	+05	21	15.6194398	0.00000326	0.0000723	-0.4380	53609.7	58937.2	146	0.21	0.20	2.89
0432-606	0432-606	2628	04	33	34.10841962	-60	30	13.7695448	0.00001424	0.0001506	-0.0653	56394.8	58643.4	15			
0434-188	P 0434-188	126	04	37	1.48273814	-18	44	48.6141068	0.00000623	0.0001090	-0.6432	55738.9	58895.3	81	0.05	0.07	
0437-719	0437-719	4161	04	37	4.37834517	-71	48	20.1650852	0.00003091	0.0001350	0.3329	56297.7	58644.0	13			
0436-129	0436-129	1477	04	38	35.02099607	-12	51	3.3592429	0.00000392	0.0000836	-0.4527	55228.0	58937.2	112	0.12	0.08	
0438-436	P 0438-43	127	04	40	17.17997229	-43	33	8.6049246	0.00000662	0.0000855	-0.2835	55793.7	58937.0	76		0.17	
0441-699	0441-699	4162	04	40	47.75740634	-69	52	18.0867053	0.00001986	0.0001189	0.0237	56297.7	58643.8	15			
0440-520	0440-520	4163	04	41	58.27715876	-51	54	54.1695433	0.00002849	0.0007127	-0.1993	56394.5	58643.8	9			
0442+389	0442+389	1481	04	46	11.49405138	+39	00	17.0997751	0.00000712	0.0001836	0.0207	55304.7	58937.3	53	0.03	0.02	
0446+112	P 0446+11	131	04	49	7.67110701	+11	21	28.5961527	0.00000312	0.0000688	-0.4075	53561.8	58937.2	150	0.22	0.23	
0454-810	P 0454-81	756	04	50	5.44016698	-81	01	2.2315987	0.00003158	0.0000705	-0.0223	56275.6	58644.0	17			
0447+227	0447+227	1486	04	50	51.94468297	+22	49	5.8984514	0.00000881	0.0001404	-0.7566	56087.9	58895.4	75	0.02	0.03	
0446+595	0446+595	1264	04	51	18.72181723	+59	35	32.1834655	0.00000906	0.0000899	0.1556	55227.1	58874.2	44	0.04		
0450+013	0450+013	1487	04	53	2.23860934	+01	28	35.6286456	0.00000388	0.0000872	-0.4886	53644.3	58937.2	133	0.05	0.04	0.81
0454-234	0454-234	758	04	57	3.17920754	-23	24	52.0205323	0.00000398	0.0000800	-0.3853	53561.8	58937.2	119	0.19	0.51	1.88

Source Name		ID No.	Right Ascension			Declination			RA Error (s)	Dec. Error (arcsec)	RA–Dec Corr.	Observation Epoch MJD		No. Obs.	Source Flux (Jy)		K Struct Index
B1950	Common		H	M	S	D	M	S				First	Last		10-60	10-40	
0458-020	P 0458-02	137	05	01	12.80988523	-01	59	14.2566604	0.00000307	0.0000716	-0.3883	53687.2	58937.1	158	0.48	0.42	
0459+135	P 0459+135	1031	05	02	33.21952678	+13	38	10.9588467	0.00000431	0.0000819	-0.5430	53852.1	58937.2	92	0.04	0.05	1.83
0459+252	0459+252	1493	05	02	58.47477521	+25	16	25.2755639	0.00000391	0.0000748	-0.4317	55262.8	58937.3	107	0.11	0.10	
0502+049	P 0502+049	142	05	05	23.18472173	+04	59	42.7243673	0.00000325	0.0000729	-0.4388	53561.9	58937.2	146	0.19	0.25	2.11
0507-611	0507-611	4164	05	07	54.67067741	-61	04	43.1159066	0.00001519	0.0001918	0.0128	56395.6	58643.9	15			
0506+056	0506+056	1265	05	09	25.96446844	+05	41	35.3335855	0.00000355	0.0000812	-0.4526	53603.5	58937.2	132	0.13	0.05	1.96
0506+101	P 0506+101	677	05	09	27.45706800	+10	11	44.6000129	0.00000377	0.0000781	-0.5350	53560.9	58937.2	127	0.08	0.07	
0507+179	P 0507+17	678	05	10	2.36913236	+18	00	41.5814660	0.00000312	0.0000666	-0.3788	53561.9	58937.3	156	0.64	0.55	
0508+138	0508+138	1033	05	11	38.31966670	+13	57	19.1933279	0.00000515	0.0001007	-0.5477	53561.8	58937.3	108	0.03	0.02	
0511-220	P 0511-220	143	05	13	49.11430386	-21	59	16.0922671	0.00000488	0.0000893	-0.5362	53561.8	58937.2	105	0.07	0.16	1.8
0510+559	0510+559	2677	05	14	18.69963124	+56	02	11.0528688	0.00000692	0.0000831	0.1136	55304.7	58874.2	50	0.05		
0517-726	0517-726	761	05	16	37.71908671	-72	37	7.4657055	0.00002647	0.0001215	0.0162	56297.7	58643.8	14			
0516-621	0516-621	762	05	16	44.92613213	-62	07	5.3897019	0.00001623	0.0001345	-0.1087	56297.7	58643.9	16			
0515+208	0515+208	1034	05	18	3.82452152	+20	54	52.4972850	0.00000488	0.0001035	-0.5389	55304.7	58937.3	89	0.03	0.04	
0520-165	0520-165	1506	05	22	44.65492859	-16	27	52.4062292	0.00000896	0.0001734	-0.6597	56801.9	58937.2	51	0.04	0.02	
0524+034	J0527+0331	1037	05	27	32.70543972	+03	31	31.5164182	0.00000307	0.0000718	-0.4273	53609.7	58937.2	150	0.21	0.18	0.82
0530-727	P 0530-728	765	05	29	30.04215887	-72	45	28.5076270	0.00001831	0.0001047	-0.0849	56297.5	58643.9	16			
0527-053	0527-053	1511	05	29	53.53350128	-05	19	41.6175937	0.00000389	0.0000864	-0.4965	55263.0	58937.2	116	0.07	0.05	
0528+134	P 0528+134	148	05	30	56.41674390	+13	31	55.1493189	0.00000307	0.0000675	-0.4045	53561.0	58937.2	157	0.24	0.23	2.37
0529+483	J0533+4822	1038	05	33	15.86580235	+48	22	52.8076765	0.00000508	0.0000867	0.0930	55059.0	58874.5	54	0.14		
0534-611	0534-611	767	05	34	35.77245528	-61	06	7.0732952	0.00001795	0.0001533	0.1729	56394.5	58643.8	13			
0534-340	0534-340	1040	05	36	28.43234428	-34	01	11.4687862	0.00000598	0.0000887	-0.4616	53609.6	58937.0	93		0.11	1.41
0537-441	P 0537-441	149	05	38	50.36154162	-44	05	8.9396960	0.00001017	0.0001025	-0.4571	53561.8	58937.0	93		0.21	2.33
0536+145	0536+145	679	05	39	42.36599636	+14	33	45.5614785	0.00000336	0.0000722	-0.4257	53561.8	58937.1	124	0.13	0.10	
0539-543	0539-543	4165	05	40	45.84804042	-54	18	22.0959566	0.00001032	0.0001927	0.2472	56394.5	58643.8	14			
0544+273	0544+273	680	05	47	34.14893436	+27	21	56.8424973	0.00000373	0.0000785	-0.4056	53603.4	58937.3	133	0.10	0.07	0.79
0549-575	0549-575	2713	05	50	9.58017993	-57	32	24.3965970	0.00001351	0.0001488	-0.0314	56394.7	58643.8	14			
0547+234	0547+234	1041	05	50	47.39090549	+23	26	48.1770327	0.00000440	0.0001000	-0.3742	53840.9	58937.3	96	0.03	0.03	1.88
0548+084	0548+084	1521	05	51	11.22934396	+08	29	11.2218705	0.00000480	0.0001151	-0.5626	55304.8	58937.2	92	0.05	0.02	
0552+398	DA 193	152	05	55	30.80562048	+39	48	49.1650602	0.00000370	0.0000588	-0.1748	53561.0	58937.3	151	0.28	0.28	2.29
0556+238	0556+238	681	05	59	32.03313591	+23	53	53.9264309	0.00000419	0.0000927	-0.3862	53644.3	58937.3	112	0.06	0.04	1.21
0601-706	0601-706	4166	06	01	11.24774293	-70	36	8.7923992	0.00001927	0.0001134	0.1291	56297.7	58643.5	15			
0600+177	0600+177	682	06	03	9.13027111	+17	42	16.8103247	0.00000516	0.0000946	-0.6343	55227.0	58937.3	100	0.03	0.04	
0602-424	0602-424	2729	06	04	25.17463789	-42	25	30.0936994	0.00000657	0.0000896	-0.3787	55451.7	58937.0	81		0.12	
0601+245	0601+245	1045	06	04	55.12143805	+24	29	55.0365991	0.00000481	0.0000893	-0.4300	53840.9	58937.3	100	0.04	0.04	2.46
0607-605	0607-605	4167	06	07	55.08668929	-60	31	51.9927606	0.00001741	0.0001587	0.1623	56275.6	58643.9	14			
0605-085	P 0605-08	158	06	07	59.69922681	-08	34	49.9784757	0.00000320	0.0000736	-0.4054	53561.0	58937.2	136	0.29	0.41	
0607-549	0607-549	4168	06	08	49.05958489	-54	56	42.8838536	0.00001220	0.0001811	-0.0052	56394.5	58643.8	15			
0606-223	P 0606-223	1526	06	08	59.68683046	-22	20	20.9569149	0.00000502	0.0000862	-0.4434	55451.7	58937.2	87	0.12	0.06	
0607-157	P 0607-15	160	06	09	40.94951614	-15	42	40.6727999	0.00000352	0.0000766	-0.4090	53560.9	58937.2	138	0.29	0.21	
0611+131	0611+131	683	06	13	57.69275716	+13	06	45.4006454	0.00000355	0.0000824	-0.4826	53840.9	58937.2	117	0.19	0.06	1.7
0621-787	0621-787	2749	06	18	30.15877938	-78	43	2.1412304	0.00004301	0.0001076	0.0525	56275.7	58643.9	17			
0622-645	0622-645	4169	06	23	7.69631013	-64	36	20.7229722	0.00003388	0.0003080	0.7751	56297.5	58643.4	14			
0621+446	0621+446	2761	06	25	18.26539467	+44	40	1.6261319	0.00000509	0.0000702	-0.1682	55451.8	58937.3	100	0.08	0.07	1.64
0624-603	0624-603	4170	06	25	24.28948454	-60	20	29.5081297	0.00006950	0.0008616	-0.1781	56522.0	57229.8	2			
0624-546	0624-546	4171	06	25	52.23068757	-54	38	50.7070077	0.00002037	0.0004579	-0.0079	56395.6	58643.9	13			
0628+203	0628+203	2768	06	31	1.06256675	+20	20	59.2108162	0.00000388	0.0000799	-0.3956	55304.8	58937.3	98	0.08	0.06	
0629-418	0629-418	778	06	31	11.99804887	-41	54	26.9478713	0.00000776	0.0000933	-0.4858	55451.7	58937.0	81		0.14	
0633+595	0633+596	2780	06	38	2.87196343	+59	33	22.2139094	0.00000764	0.0000816	0.2297	54820.1	58874.1	57	0.05		
0639-032	0639-032	1267	06	41	51.13293821	-03	20	48.5824774	0.00000322	0.0000729	-0.4125	53609.7	58937.2	141	0.22	0.28	1.78

Source Name		ID No.	Right Ascension			Declination			RA Error (s)	Dec. Error (arcsec)	RA–Dec Corr.	Observation Epoch MJD		No. Obs.	Source Flux (Jy)		K Struct Index
B1950	Common		H	M	S	D	M	S				First	Last		10-60	10-40	
0603+882	0603+882	1556	06	42	6.13545060	+88	11	55.0155390	0.00011856	0.0000583	-0.1127	56053.3	58874.2	48	0.04		
0639+352	0639+352	1558	06	42	58.13962236	+35	09	18.3788290	0.00000452	0.0000870	-0.3590	55304.8	58937.3	100	0.05	0.04	2.83
0644-671	0644-671	4172	06	44	28.04404943	-67	12	57.3585977	0.00002384	0.0001462	-0.0607	56275.7	58643.4	14			
0641+392	0641+393	1560	06	44	53.70958702	+39	14	47.5334910	0.00000782	0.0001574	-0.0527	55059.5	58937.3	64	0.02	0.02	
0642+449	OH 471	171	06	46	32.02600956	+44	51	16.5900166	0.00000423	0.0000582	-0.1094	53561.1	58937.3	140	0.23	0.25	2.34
0646-306	P 0646-306	173	06	48	14.09644774	-30	44	19.6601968	0.00000525	0.0000842	-0.4139	53609.7	58937.2	91		0.13	2.82
0648-165	0648-165	782	06	50	24.58183574	-16	37	39.7255212	0.00000360	0.0000767	-0.3545	53560.9	58937.2	137	0.27	0.09	2.06
0654+244	0654+244	1053	06	57	5.67552605	+24	23	55.3938278	0.00000396	0.0000758	-0.4521	53840.8	58937.3	121	0.07	0.09	1.89
0656+082	0656+082	785	06	59	17.99601620	+08	13	30.9536034	0.00001310	0.0002223	-0.7917	55647.9	58937.3	46	0.02	0.02	
0657+172	0657+172	684	07	00	1.52554597	+17	09	21.7012162	0.00000336	0.0000715	-0.4480	53561.1	58937.3	129	0.12	0.12	
0700-465	0700-465	4069	07	01	34.54670729	-46	34	36.6271659	0.00000786	0.0000955	-0.4132	56297.5	58860.3	49		0.18	
0700-197	0700-197	1576	07	02	42.90065693	-19	51	22.0357288	0.00000382	0.0000780	-0.3725	55451.7	58937.2	106	0.28	0.30	
0707+476	0707+476	786	07	10	46.10489799	+47	32	11.1424823	0.00000493	0.0000754	0.0323	53644.3	58874.3	86	0.10	0.09	1.9
0708+506	0708+506	1583	07	12	43.68361156	+50	33	22.7070623	0.00000555	0.0000813	0.0397	55304.8	58874.0	49	0.11		
0716+332	0716+332	1587	07	19	19.41969306	+33	07	9.7083317	0.00000394	0.0000715	-0.3358	55304.8	58937.3	111	0.12	0.09	
0716+477	0716+477	1269	07	20	21.49777656	+47	37	44.1248476	0.00000634	0.0001009	-0.0289	54170.1	58874.0	61	0.04	0.06	1.63
0716+714	0716+714	788	07	21	53.44847989	+71	20	36.3633665	0.00000909	0.0000461	0.0738	55059.0	58874.5	57	0.65		
0721-071	0721-071	1270	07	24	17.29262901	-07	15	20.3522496	0.00000332	0.0000761	-0.3714	53609.8	58937.2	149	0.15	0.09	1.36
0722+145	P 0722+145	685	07	25	16.80777438	+14	25	13.7463996	0.00000343	0.0000692	-0.4631	53560.9	58937.3	141	0.14	0.18	1.29
0723-008	DW 0723-00	180	07	25	50.63997929	-00	54	56.5448559	0.00000343	0.0000785	-0.5624	53560.9	58937.3	122	0.25	0.69	
0725+219	0725+219	1056	07	28	20.60830323	+21	53	6.3901602	0.00000364	0.0000748	-0.4332	54128.1	58937.3	119	0.12	0.11	1.97
0727-115	P 0727-11	182	07	30	19.11246609	-11	41	12.6007203	0.00000307	0.0000717	-0.3310	53560.9	58937.2	161	0.50	0.20	
0731+050	J0733+0456	1058	07	33	57.45990075	+04	56	14.4963945	0.00000322	0.0000706	-0.4086	55263.0	58937.3	123	0.20	0.14	
0736-770	0736-770	4173	07	34	43.41984545	-77	11	13.4847663	0.00004831	0.0001402	0.0119	56297.6	58643.9	14			
0735+178	P 0735+17	190	07	38	7.39375852	+17	42	18.9980402	0.00000413	0.0000777	-0.5548	53561.0	58937.3	138	0.04	0.07	
0738-674	0738-674	791	07	38	56.49623648	-67	35	50.8263534	0.00003064	0.0002753	0.3393	56395.7	58643.1	11			
0736+017	P 0736+01	192	07	39	18.03390252	+01	37	4.6175804	0.00000302	0.0000683	-0.3840	53561.0	58937.3	156	0.32	0.46	
0742-562	0742-562	4174	07	43	20.48510848	-56	19	32.9585716	0.00001424	0.0002938	0.4012	56394.5	58644.0	13			
0743-673	0743-673	2850	07	43	31.61176276	-67	26	25.5468353	0.00004590	0.0001962	0.1833	56297.6	58643.3	10			
0742+263	0742+263	4175	07	45	5.92252073	+26	14	9.7707426	0.00000450	0.0001001	-0.5524	56746.4	58937.3	69	0.06	0.05	
0743-006	P 0743-006	197	07	45	54.08227779	-00	44	17.5407371	0.00000378	0.0000945	-0.5349	53852.1	58937.3	110	0.10	0.05	3.16
0743+259	GC 0743+25	198	07	46	25.87418727	+25	49	2.1345976	0.00000387	0.0000774	-0.4642	53561.0	58937.3	120	0.07	0.08	
0745+241	B2 0745+24	200	07	48	36.10929137	+24	00	24.1098615	0.00000339	0.0000684	-0.3826	53561.0	58937.3	147	0.16	0.16	1.97
0746+483	0746+483	1223	07	50	20.43636079	+48	14	53.5566477	0.00000529	0.0000948	0.0631	53644.5	58874.3	72	0.07		2.31
0748+126	P 0748+126	202	07	50	52.04573859	+12	31	4.8280995	0.00000306	0.0000666	-0.3836	53561.1	58937.3	150	0.23	0.23	1.69
0749+540	0749+540	793	07	53	1.38459321	+53	52	59.6368411	0.00000543	0.0000788	0.0418	53568.2	58874.7	74	0.11		1.92
0752+258	0752+258	4176	07	55	37.03268889	+25	42	39.0230548	0.00003675	0.0007897	-0.7450	56892.9	57440.2	7	0.01	0.02	
0754+100	P 0754+100	206	07	57	6.64296009	+09	56	34.8520925	0.00000310	0.0000723	-0.4297	53561.0	58937.4	152	0.27	0.11	2.41
0759+183	J0802+1809	1060	08	02	48.03197892	+18	09	49.2492534	0.00000576	0.0001216	-0.5268	53561.1	58937.2	94	0.03	0.03	1.72
0805-077	P 0805-07	210	08	08	15.53602770	-07	51	9.8865962	0.00000304	0.0000699	-0.3151	53561.0	58937.2	159	0.40	0.29	
0804+499	OJ 508	795	08	08	39.66631454	+49	50	36.5302304	0.00000488	0.0000791	0.0377	53603.4	58874.7	79	0.12		0.7
0805+410	0805+410	796	08	08	56.65206466	+40	52	44.8889782	0.00000404	0.0000616	-0.1974	53561.1	58937.3	134	0.20	0.30	1.18
0808+019	P 0808+019	211	08	11	26.70731122	+01	46	52.2200262	0.00000304	0.0000683	-0.4150	53560.9	58937.3	158	0.32	0.36	0.95
0812+367	0812+367	797	08	15	25.94487377	+36	35	15.1486716	0.00000425	0.0000734	-0.3626	53644.5	58937.3	119	0.10	0.09	2.74
0814+425	OJ 425	214	08	18	15.99962599	+42	22	45.4149473	0.00000412	0.0000630	-0.2022	53561.1	58895.5	138	0.11	0.14	1.49
0820+560	0820+560	702	08	24	47.23635929	+55	52	42.6694233	0.00000605	0.0000721	0.0504	53644.5	58874.7	69	0.08		2.31
0821+394	0821+394	798	08	24	55.48386982	+39	16	41.9040084	0.00000410	0.0000646	-0.3032	53799.0	58937.3	134	0.13	0.14	0.92
0823+033	P 0823+033	221	08	25	50.33835744	+03	09	24.5199121	0.00000291	0.0000662	-0.3642	53561.0	58937.3	168	0.31	0.23	1.59
0827+243	B2 0827+24	224	08	30	52.08619864	+24	10	59.8202812	0.00000335	0.0000673	-0.3982	53561.0	58937.3	151	0.15	0.23	1.76
0834-201	P 0834-20	804	08	36	39.21524080	-20	16	59.5045304	0.00000408	0.0000781	-0.3816	53609.8	58937.2	118	0.12	0.12	

Source Name		ID No.	Right Ascension			Declination			RA Error (s)	Dec. Error (arcsec)	RA–Dec Corr.	Observation Epoch MJD		No. Obs.	Source Flux (Jy)		K Struct Index
B1950	Common		H	M	S	D	M	S				First	Last		10-60	10-40	
0834+250	OJ 259	1063	08	37	40.24569386	+24	54	23.1215303	0.00000422	0.0000797	-0.5325	53561.1	58937.3	123	0.06	0.11	1.95
0838+133	0838+133A	1272	08	40	47.58841961	+13	12	23.5637669	0.00000321	0.0000681	-0.3859	53609.9	58937.2	144	0.12	0.15	
0839+187	GC 0839+18	234	08	42	5.09416288	+18	35	40.9896135	0.00000411	0.0000977	-0.4627	54449.3	58937.3	111	0.05	0.03	1.48
0838+456	0838+456	4177	08	42	15.35179180	+45	25	44.1818261	0.00003659	0.0020294	0.5489	56907.5	57600.7	8	0.01		
0841-607	0841-607	4178	08	42	26.56107452	-60	53	50.4019259	0.00001330	0.0001321	0.2696	56297.7	58643.4	14			
0843-547	0843-547	4179	08	45	2.48269838	-54	58	8.5400453	0.00001517	0.0003558	-0.0529	56275.6	58643.5	14			
0844-652	0844-652	4180	08	45	11.33502254	-65	27	23.1624951	0.00005056	0.0003704	0.0070	56521.9	57851.2	6			
0844-557	0844-557	4181	08	45	49.67977079	-55	55	26.7419664	0.00001498	0.0003097	-0.2472	56394.7	58643.6	15			
0845-051	0845-051	1651	08	47	58.72492092	-05	20	33.9002583	0.00000453	0.0000900	-0.5460	55451.9	58937.4	109	0.05	0.05	
0847-354	0847-354	2944	08	49	45.62346954	-35	41	1.2788264	0.00000646	0.0000881	-0.4638	55178.5	58937.2	86		0.13	
0847-120	0847-120	1653	08	50	9.63562793	-12	13	35.3762550	0.00000349	0.0000738	-0.3492	55304.9	58937.4	118	0.17	0.19	
0850-522	0850-522	4182	08	51	55.84912168	-52	28	12.7798495	0.00001415	0.0002719	-0.5504	56275.6	58643.9	15			
0851-577	0851-577	4183	08	52	38.72588107	-57	55	29.8092825	0.00001269	0.0001412	-0.1963	56297.7	58643.9	15			
0850+284	0850+284	4184	08	53	17.82844821	+28	13	49.9975767	0.00000587	0.0001395	-0.5621	56313.3	58874.2	63	0.03	0.03	
0850+581	0850+581	808	08	54	41.99638768	+57	57	29.9396821	0.00000819	0.0001180	-0.0761	54128.1	58874.6	49	0.03		1.83
0851+202	OJ 287	236	08	54	48.87493101	+20	06	30.6407604	0.00000289	0.0000609	-0.3420	53561.0	58937.3	162	0.76	1.31	
0854-108	0854-108	1657	08	56	41.80415039	-11	05	14.4305041	0.00000423	0.0000802	-0.4166	55451.8	58937.4	106	0.07	0.09	
0859-140	P 0859-14	240	09	02	16.83090700	-14	15	30.8758256	0.00000507	0.0000894	-0.6064	54961.2	58937.4	114	0.03	0.12	
0859+470	OJ 499	239	09	03	3.99011560	+46	51	4.1373099	0.00000455	0.0000699	-0.0407	53561.2	58895.5	98	0.14	0.13	
0901+697	J0906+6930	4185	09	06	30.74875309	+69	30	30.8285274	0.00002912	0.0001485	0.1147	56234.4	58453.2	18	0.01		
0906+163	0906+163	1068	09	08	55.92534899	+16	09	54.7636540	0.00000451	0.0000976	-0.4991	55227.2	58937.3	111	0.03	0.03	1.15
0906+015	P 0906+01	244	09	09	10.09160391	+01	21	35.6173241	0.00000320	0.0000714	-0.3837	53561.0	58937.2	136	0.13	0.13	
0912+029	P 0912+029	245	09	14	37.91343922	+02	45	59.2460503	0.00000328	0.0000726	-0.4197	53561.0	58937.2	144	0.10	0.11	1.6
0916+336	0916+336	2985	09	19	8.78715344	+33	24	41.9433106	0.00000570	0.0001030	-0.5429	55304.9	58874.3	95	0.03	0.04	
0918-534	0918-534	4186	09	19	44.03956485	-53	40	6.4466981	0.00004149	0.0004304	0.3196	56297.5	58643.5	7			
0917+449	0917+449	810	09	20	58.45851157	+44	41	53.9848165	0.00000436	0.0000580	-0.1521	53561.2	58874.3	117	0.62	0.69	
0917+624	0917+624	698	09	21	36.23112250	+62	15	52.1801529	0.00000677	0.0000535	-0.0288	53568.3	58874.5	80	0.19		2.14
0925-203	P 0925-203	686	09	27	51.82431771	-20	34	51.2329211	0.00000436	0.0000822	-0.4468	54855.5	58937.4	109	0.15	0.12	
0928+144	0928+144	3006	09	31	5.34243108	+14	14	16.5185188	0.00000435	0.0000900	-0.5913	55262.1	58937.3	107	0.04	0.06	
0933+503	J0937+5008	1072	09	37	12.32736210	+50	08	52.0975630	0.00000517	0.0000786	0.0844	55262.2	58874.7	48	0.21		
0936-069	0936-069	1696	09	38	56.10426864	-07	08	0.6189234	0.00000452	0.0000879	-0.5291	54820.3	58937.4	116	0.04	0.06	
0938-133	0938-133	1698	09	41	2.54946903	-13	35	50.9852200	0.00000496	0.0000928	-0.5679	54820.3	58937.4	112	0.05	0.06	
0941+522	0941+522	3022	09	44	52.15529725	+52	02	34.2170769	0.00000549	0.0000778	0.1230	55227.1	58874.0	52	0.12		
0944-469	0944-469	4187	09	46	51.33623580	-47	07	59.2357933	0.00015605	0.0008969	-0.7248	56899.8	57110.2	3		0.02	
0945+408	0945+408	814	09	48	55.33815486	+40	39	44.5869750	0.00000442	0.0000668	-0.2332	54016.5	58895.5	128	0.07	0.09	2.81
0950+326	0950+326	4188	09	53	27.95659898	+32	25	51.5207581	0.00000701	0.0001815	-0.2219	56102.3	58895.5	52	0.02	0.02	
0953+254	OK 290	256	09	56	49.87540177	+25	15	16.0499244	0.00000321	0.0000639	-0.3454	53561.1	58937.3	155	0.24	0.17	2.23
0955+476	0955+476	820	09	58	19.67168001	+47	25	7.8423257	0.00000497	0.0000690	-0.0486	53603.5	58874.1	103	0.08	0.16	2.45
0955+326	3C 232	259	09	58	20.94964872	+32	24	2.2094729	0.00000392	0.0000697	-0.4288	53840.9	58874.3	134	0.09	0.13	2.13
1005-333	1005-333	1714	10	07	31.38742668	-33	33	6.7167908	0.00000610	0.0000895	-0.4765	55451.8	58937.2	85		0.11	
1004+141	GC 1004+14	261	10	07	41.49809242	+13	56	29.6007489	0.00000429	0.0000856	-0.5952	53561.1	58937.3	113	0.04	0.08	
1005+066	1005+066	1273	10	08	0.81616011	+06	21	21.2157291	0.00000364	0.0000817	-0.5328	53609.9	58937.3	145	0.04	0.05	1.82
1012+232	1012+232	264	10	14	47.06547400	+23	01	16.5705826	0.00000355	0.0000692	-0.4202	53644.5	58895.4	141	0.07	0.09	2.66
1013+127	1013+127	2	10	15	44.02339435	+12	27	7.0700754	0.00000382	0.0000808	-0.5058	55262.1	58937.5	109	0.06	0.08	
1015+057	J1018+0530	1077	10	18	27.84829502	+05	30	29.9617313	0.00000444	0.0000931	-0.4763	55262.1	58937.3	100	0.04	0.03	
1016-311	1016-311	1078	10	18	28.75347485	-31	23	53.8500909	0.00000548	0.0000866	-0.4515	53651.7	58937.2	91		0.20	2.3
1019+416	1019+416	1724	10	22	2.02352731	+41	26	5.3725545	0.00000704	0.0001464	-0.0349	53686.5	58874.2	79	0.02	0.02	
1020+400	1020+400	826	10	23	11.56569813	+39	48	15.3852333	0.00000436	0.0000677	-0.3748	53610.1	58895.6	132	0.07	0.15	2.33
1020+292	1020+292	4189	10	23	24.04615855	+28	56	50.9881034	0.00000442	0.0000854	-0.4141	56031.5	58895.6	98	0.04	0.04	
1022-665	1022-665	1274	10	23	43.53317742	-66	46	48.7175915	0.00002015	0.0001725	0.0685	56297.5	58643.5	15			

Source Name		ID No.	Right Ascension			Declination			RA Error (s)	Dec. Error (arcsec)	RA–Dec Corr.	Observation Epoch MJD		No. Obs.	Source Flux (Jy)		K Struct Index
B1950	Common		H	M	S	D	M	S				First	Last		10-60	10-40	
1022+194	GC 1022+19	274	10	24	44.80960390	+19	12	20.4156724	0.00000494	0.0001119	-0.3181	54121.3	58895.4	96	0.02	0.02	1.31
1022+237	1022+237	1727	10	24	53.63729478	+23	32	33.9635114	0.00000406	0.0000821	-0.4169	53644.6	58874.4	130	0.05	0.04	1.64
1023+131	1023+131	1079	10	25	56.28538095	+12	53	49.0217291	0.00000388	0.0000796	-0.5475	55262.1	58937.5	110	0.08	0.11	
1026-084	1026-084	1731	10	28	38.79646237	-08	44	38.5360731	0.00001146	0.0001906	-0.7627	56312.4	58810.6	48	0.02	0.02	
1032-199	P 1032-199	829	10	35	2.15532268	-20	11	34.3595921	0.00000467	0.0000892	-0.4487	53651.8	58937.4	110	0.09	0.05	2.44
1034-293	P 1034-293	278	10	37	16.07973569	-29	34	2.8138398	0.00000495	0.0000827	-0.4340	53561.0	58937.4	99		0.39	1.96
1036-529	1036-529	4080	10	38	40.65715595	-53	11	43.2704976	0.00001089	0.0001654	-0.2872	56275.6	58643.6	16			
1038+064	OL 064.5	279	10	41	17.16249977	+06	10	16.9237409	0.00000313	0.0000722	-0.4349	53561.1	58937.3	130	0.28	0.17	
1039+811	1039+811	832	10	44	23.06262524	+80	54	39.4430796	0.00001892	0.0000457	0.0850	53568.7	58874.7	78	0.21		2.04
1042+071	P 1042+071	687	10	44	55.91124942	+06	55	38.2624505	0.00000374	0.0000835	-0.5240	53561.1	58937.5	126	0.05	0.07	
1045-188	1045-188	833	10	48	6.62060415	-19	09	35.7273154	0.00000405	0.0000795	-0.4184	53561.1	58895.5	133	0.14	0.17	1.95
1046-409	1046-409	3084	10	48	38.27112537	-41	14	0.1158896	0.00001052	0.0001046	-0.5733	55793.9	58937.2	71		0.07	
1048-313	P 1048-313	284	10	51	4.77751368	-31	38	14.3080398	0.00001664	0.0001764	-0.8775	53609.9	58937.4	62		0.04	3.06
1049-534	1049-534	4190	10	51	9.09986194	-53	44	46.5437738	0.00002024	0.0003815	-0.3463	56297.5	58643.6	12			
1049+215	P 1049+21	834	10	51	48.78908756	+21	19	52.3136242	0.00000379	0.0000762	-0.4010	53561.1	58895.6	127	0.06	0.03	
1052+023	1052+023	4191	10	55	17.27242382	+02	05	44.9020046	0.00001015	0.0002314	-0.6801	56893.1	58937.3	49	0.02	0.02	
1053+704	1053+704	835	10	56	53.61753325	+70	11	45.9156616	0.00000989	0.0000531	0.1305	55262.2	58874.5	48	0.19		
1053+815	1053+815	836	10	58	11.53538221	+81	14	32.6751566	0.00001944	0.0000453	0.0461	53567.8	58874.5	84	0.18		0.93
1055+018	P 1055+01	287	10	58	29.60521402	+01	33	58.8234582	0.00000283	0.0000655	-0.3829	53561.0	58937.5	164	0.58	1.45	
1059-631	1059-631	4192	11	01	54.37844990	-63	25	22.5999300	0.00001764	0.0001351	0.0801	56275.7	58644.0	16			
1101+384	B2 1101+38	291	11	04	27.31396496	+38	12	31.7988551	0.00000412	0.0000694	-0.3058	53561.1	58937.6	140	0.08	0.08	1.53
1102-242	1102-242	3103	11	04	46.17642332	-24	31	25.7999514	0.00000643	0.0000980	-0.6048	55451.8	58895.4	80	0.06	0.09	
1109+076	1109+076	1756	11	12	9.55849234	+07	24	49.1176843	0.00004466	0.0007336	-0.9125	56417.9	58362.9	13		0.01	
1111+149	GC 1111+14	296	11	13	58.69509206	+14	42	26.9525368	0.00000415	0.0000898	-0.5505	53561.1	58937.4	119	0.04	0.03	
1115-122	1115-122	3120	11	18	17.14137356	-12	32	54.2621379	0.00000430	0.0000857	-0.5572	55178.6	58937.4	106	0.11	0.22	
1116+128	P 1116+12	297	11	18	57.30144103	+12	34	41.7178680	0.00000310	0.0000707	-0.3943	53561.1	58937.5	133	0.18	0.12	
1119-069	1119-069	1758	11	21	42.12293529	-07	11	6.3420238	0.00000507	0.0001029	-0.6405	55262.2	58937.5	104	0.04	0.05	
1123+264	P 1123+26	299	11	25	53.71193584	+26	10	19.9785717	0.00000384	0.0000744	-0.3767	53561.2	58895.6	118	0.06	0.05	
1124-186	P 1124-186	300	11	27	4.39244026	-18	57	17.4420248	0.00000377	0.0000801	-0.4178	53561.0	58937.4	136	0.38	0.25	1.32
1128+385	GC 1128+38	302	11	30	53.28262847	+38	15	18.5467876	0.00000398	0.0000649	-0.2896	53561.3	58874.2	139	0.19	0.21	1.93
1129-580	1129-580	1088	11	31	43.28807033	-58	18	53.4427688	0.00001676	0.0001566	-0.2260	56275.6	58643.1	14			
1129-558	1129-558	4193	11	32	16.41468682	-56	06	44.7350040	0.00001614	0.0001732	0.0348	56297.5	58643.6	14			
1130+106	1130+106	4194	11	32	59.48879894	+10	23	42.2133421	0.00000464	0.0000982	-0.6337	56738.1	58937.5	75	0.03	0.05	
1130+009	P 1130+009	304	11	33	20.05579428	+00	40	52.8369852	0.00000361	0.0000852	-0.4581	53561.2	58937.5	120	0.06	0.06	
1133-681	1133-681	4195	11	36	2.09814996	-68	27	5.8226896	0.00002736	0.0001557	0.1588	56275.7	58643.4	16			
1136-466	1136-466	4196	11	38	55.55906798	-46	53	42.2605515	0.00001650	0.0001390	-0.5226	56297.5	58810.6	38		0.03	
1140+668	1140+668	3157	11	43	41.60336679	+66	33	31.2295985	0.00001553	0.0001221	0.0550	56738.2	58874.7	39	0.02		
1143-696	1143-696	3160	11	45	53.62413627	-69	54	1.7977602	0.00002422	0.0001335	0.0927	56275.7	58643.4	15			
1143-287	1143-287	1774	11	46	26.18858243	-28	59	18.5052819	0.00000586	0.0000914	-0.5199	55793.9	58937.4	81		0.13	
1143-332	1143-332	1776	11	46	28.45175757	-33	28	42.6327697	0.00000838	0.0001099	-0.6077	55863.7	58937.4	71		0.04	
1144+402	1144+402	699	11	46	58.29792943	+39	58	34.3044651	0.00000373	0.0000580	-0.2024	53561.3	58937.6	147	0.37	0.43	1.09
1144-379	P 1144-379	309	11	47	1.37069746	-38	12	11.0240215	0.00000645	0.0000872	-0.4200	53561.0	58937.4	90		0.17	2.06
1145-676	1145-676	4197	11	47	33.39950224	-67	53	41.7699127	0.00001895	0.0001134	-0.1604	56297.5	58643.5	15			
1145-071	1145-071	689	11	47	51.55403930	-07	24	41.1414232	0.00000374	0.0000778	-0.4801	53561.1	58937.3	126	0.08	0.17	
1147+245	B2 1147+24	845	11	50	19.21219084	+24	17	53.8350408	0.00000354	0.0000735	-0.4144	53561.2	58937.6	137	0.10	0.09	2.18
1150-834	1150-834	4198	11	52	53.22191394	-83	44	9.4406240	0.00008792	0.0001433	0.0087	56275.7	58643.8	17			
1150+812	1150+812	847	11	53	12.49926436	+80	58	29.1545534	0.00002041	0.0000458	0.1411	53798.7	58874.2	70	0.20		3.18
1150+497	4C 49.22	848	11	53	24.46666203	+49	31	8.8301105	0.00000483	0.0000705	-0.0010	53568.1	58874.5	74	0.20		2.33
1156-215	J1159-2150	4199	11	59	10.78555162	-21	50	4.6767294	0.00020901	0.0025205	-0.9854	56893.0	58601.3	7		0.01	
1156-214	1156-214	1784	11	59	21.43252539	-21	42	44.9134664	0.00000859	0.0001260	-0.6490	56711.3	58839.6	37	0.09	0.11	

Source Name		ID No.	Right Ascension			Declination			RA Error (s)	Dec. Error (arcsec)	RA–Dec Corr.	Observation Epoch MJD		No. Obs.	Source Flux (Jy)		K Struct Index
B1950	Common		H	M	S	D	M	S				First	Last		10-60	10-40	
1156+295	GC 1156+29	319	11	59	31.83392619	+29	14	43.8266450	0.00000341	0.0000645	-0.3750	53561.1	58937.6	157	0.47	0.48	1.23
1157+014	1157+014	4200	11	59	44.82785329	+01	12	6.9836639	0.00001639	0.0003072	-0.8150	56746.4	58937.4	29	0.02	0.02	
1157-215	1157-215	4201	11	59	51.90595020	-21	48	53.7055380	0.00001659	0.0002110	-0.8798	56088.2	58839.6	41	0.05	0.05	
1158+007	1158+007	1786	12	01	23.25078139	+00	28	28.3155375	0.00000614	0.0001178	-0.7147	55738.2	58937.5	92	0.02	0.03	
1204-613	1204-613	4202	12	06	51.49646456	-61	38	56.7597746	0.00002409	0.0001989	0.0010	56297.5	58643.6	13			
1205-008	1205-008	1792	12	07	41.67761640	-01	06	36.6902877	0.00000336	0.0000747	-0.4186	55262.2	58937.5	116	0.07	0.11	
1207-319	1207-319	1276	12	09	40.04460968	-32	14	53.1078795	0.00001020	0.0001318	-0.7366	53651.9	58937.4	69		0.05	2.01
1213-172	P 1213-17	326	12	15	46.75175379	-17	31	45.4034061	0.00000480	0.0000858	-0.5405	53693.8	58937.4	110	0.08	0.14	
1215+303	B2 1215+30	328	12	17	52.08198330	+30	07	0.6358474	0.00000391	0.0000737	-0.4047	54961.3	58937.6	115	0.09	0.09	
1215-002	1215-002	3210	12	17	58.72904472	-00	29	46.2999746	0.00000366	0.0000858	-0.5599	55262.2	58937.4	99	0.12	0.17	
1219+044	P 1219+04	336	12	22	22.54962749	+04	13	15.7758755	0.00000296	0.0000682	-0.4084	53561.2	58937.5	136	0.28	0.31	
1222+037	P 1222+037	337	12	24	52.42194493	+03	30	50.2924528	0.00000309	0.0000705	-0.4061	53561.1	58937.5	129	0.34	0.34	
1221-829	1221-829	4203	12	24	54.38254141	-83	13	10.1017829	0.00007179	0.0001502	-0.1781	56275.7	58644.0	17			
1222+216	P 1222+21	1230	12	24	54.45842212	+21	22	46.3884149	0.00000358	0.0000717	-0.3326	55304.2	58937.6	109	0.06	0.05	
1226-028	1226-028	855	12	28	36.91729095	-03	04	39.3122446	0.00001885	0.0004632	-0.6555	55227.3	57565.3	17	0.02	0.01	
1227+255	1227+255	1097	12	30	14.08935918	+25	18	7.1361482	0.00000368	0.0000705	-0.3737	55304.2	58937.6	105	0.09	0.10	
1236+077	P 1236+077	344	12	39	24.58833091	+07	30	17.1888965	0.00000326	0.0000723	-0.4549	53610.0	58937.6	150	0.06	0.17	
1240-679	1240-679	4204	12	43	45.22001917	-68	11	3.4326828	0.00003738	0.0002371	-0.3710	56297.5	58643.4	12			
1243-072	1243-072	690	12	46	4.23210470	-07	30	46.5748428	0.00000307	0.0000724	-0.3417	53610.0	58937.5	148	0.20	0.10	1.33
1244-255	P 1244-255	350	12	46	46.80202077	-25	47	49.2892318	0.00000493	0.0000838	-0.4609	53561.1	58937.4	89	0.71	0.58	
1245-062	1245-062	1308	12	48	22.97565941	-06	32	9.8183809	0.00000374	0.0000864	-0.4361	55730.9	58937.5	114	0.06	0.06	
1249-673	1249-673	4205	12	52	43.21203096	-67	37	38.7467002	0.00002248	0.0001452	0.2948	56275.7	58643.4	16			
1252+119	P 1252+11	351	12	54	38.25562808	+11	41	5.8947804	0.00000323	0.0000705	-0.3937	54961.3	58937.6	118	0.10	0.12	
1251-713	P 1251-71	862	12	54	59.92151948	-71	38	18.4365884	0.00002119	0.0001020	0.0663	56275.7	58643.4	17			
1253-055	3C 279	352	12	56	11.16657619	-05	47	21.5253673	0.00000290	0.0000680	-0.3001	55969.6	58937.5	113	3.25	1.01	
1256-220	1256-220	1278	12	58	54.47876769	-22	19	31.1252263	0.00000435	0.0000848	-0.4161	53757.4	58937.5	100	0.22	0.16	1.92
1300+485	1300+485	3281	13	02	17.19609192	+48	19	17.5745006	0.00000589	0.0001000	-0.1053	55227.2	58874.5	55	0.05		
1300-554	1300-554	4206	13	03	49.21590529	-55	40	31.6080979	0.00001469	0.0001551	-0.2486	56297.5	58643.1	13			
1302-102	P 1302-102	359	13	05	33.01501339	-10	33	19.4285690	0.00000325	0.0000739	-0.3375	53610.0	58937.5	146	0.32	0.19	2.34
1304-668	1304-668	4207	13	08	17.37545732	-67	07	5.2305267	0.00002183	0.0001643	-0.0168	56297.5	58643.9	15			
1306+360	1306+360	1823	13	08	23.70914970	+35	46	37.1639757	0.00000396	0.0000663	-0.3213	55262.2	58937.6	103	0.34	0.22	
1306-395	1306-395	1824	13	09	48.48831043	-39	48	33.0862503	0.00000901	0.0001021	-0.5730	55738.2	58937.4	76		0.08	
1308+326	B2 1308+32	361	13	10	28.66387494	+32	20	43.7826827	0.00000343	0.0000620	-0.3644	53561.2	58937.6	152	0.18	0.19	1.85
1307-556	1307-556	4208	13	10	43.35556974	-55	52	11.5295797	0.00001229	0.0002169	-0.2832	56395.5	58643.8	13			
1308+554	1308+554	1279	13	11	3.21082395	+55	13	54.3223296	0.00000751	0.0000966	0.0599	53727.5	58874.5	63	0.03		0.8
1310-041	1310-041	3300	13	12	50.90122621	-04	24	49.8922013	0.00000342	0.0000767	-0.4223	55647.2	58937.6	115	0.09	0.10	
1312-533	1312-533	4209	13	15	4.18111785	-53	34	35.8746196	0.00001261	0.0001995	-0.4383	56297.5	58643.4	14			
1313-333	OP-322	363	13	16	7.98592592	-33	38	59.1730621	0.00000561	0.0000852	-0.4369	53561.1	58937.4	91		0.42	2.36
1315+346	OP 326	364	13	17	36.49419533	+34	25	15.9324645	0.00000385	0.0000717	-0.2919	53561.2	58937.6	119	0.16	0.08	
1315-058	J1318-0607	4210	13	18	33.70947739	-06	07	23.8211019	0.00002599	0.0004022	-0.9535	58069.8	58937.5	21	0.01	0.04	
1319-093	1319-093	3316	13	22	36.91262504	-09	37	37.8005024	0.00000333	0.0000769	-0.4102	55647.2	58937.5	117	0.08	0.07	
1319-652	1319-652	4211	13	22	53.88803002	-65	32	19.8920392	0.00003073	0.0004079	-0.2393	56297.6	58643.4	10			
1321-105	1321-105	3320	13	24	25.79310443	-10	49	23.1345797	0.00000339	0.0000767	-0.3802	55730.9	58937.6	116	0.20	0.19	
1324+224	1324+224	704	13	27	0.86132674	+22	10	50.1626199	0.00000315	0.0000667	-0.4124	53561.2	58937.6	151	0.17	0.16	1.36
1346-109	J1327-1336	4212	13	27	42.02367394	-13	36	0.1604279	0.00002239	0.0003156	-0.9280	57299.9	58937.5	32	0.02	0.03	
1325+126	1325+126	1837	13	27	54.68300867	+12	23	9.1779725	0.00000406	0.0000835	-0.5041	55304.2	58937.6	103	0.05	0.05	
1325-558	1325-558	1102	13	29	1.14488877	-56	08	2.6659143	0.00001294	0.0001660	-0.2785	56297.5	58643.5	13			
1329-049	1329-049	3334	13	32	4.46468206	-05	09	43.3062569	0.00000318	0.0000753	-0.3967	55730.9	58937.6	117	0.16	0.14	
1333-082	1333-082	3345	13	36	8.25982593	-08	29	51.7983426	0.00000344	0.0000968	-0.4147	55647.3	58937.5	108	0.14	0.04	
1334-127	DW 1335-12	376	13	37	39.78277100	-12	57	24.6935739	0.00000301	0.0000714	-0.3072	53561.2	58937.5	164	1.40	0.65	1.27

Source Name		ID No.	Right Ascension			Declination			RA Error (s)	Dec. Error (arcsec)	RA–Dec Corr.	Observation Epoch MJD		No. Obs.	Source Flux (Jy)		K Struct Index
B1950	Common		H	M	S	D	M	S				First	Last		10-60	10-40	
1342+663	GC 1342+663	382	13	44	8.67960510	+66	06	11.6436553	0.00000929	0.0000582	0.0728	55227.2	58874.0	52	0.06		
1341-171	1341-171	1851	13	44	14.40244615	-17	23	40.3961315	0.00000588	0.0001080	-0.6063	55738.3	58937.5	97	0.06	0.04	
1345+289	1345+289	4089	13	48	4.34910484	+28	40	25.3666186	0.00000953	0.0002494	-0.4447	56907.7	58937.6	38	0.02	0.02	
1346-109	J1349-1110	4213	13	49	3.19303911	-11	10	0.8193133	0.00000622	0.0001496	-0.5567	57299.9	58937.5	52	0.04	0.02	
1348+087	1348+087	1858	13	51	16.91906782	+08	30	39.9032157	0.00000343	0.0001042	-0.4029	55227.3	58895.6	104	0.12	0.03	
1349-439	P 1349-439	387	13	52	56.53493649	-44	12	40.3881547	0.00001004	0.0001083	-0.5304	55738.2	58810.8	67		0.04	
1351-018	P 1351-018	388	13	54	6.89532485	-02	06	3.1906720	0.00000373	0.0000879	-0.4452	53561.3	58937.6	129	0.04	0.03	
1354+195	P 1354+19	392	13	57	4.43665493	+19	19	7.3724099	0.00000314	0.0000677	-0.3775	53561.2	58937.6	132	0.23	0.24	
1354-152	OP-192	391	13	57	11.24498085	-15	27	28.7871711	0.00000372	0.0000811	-0.4061	53686.6	58895.5	135	0.13	0.10	0.91
1357+769	1357+769	874	13	57	55.37155018	+76	43	21.0510322	0.00001563	0.0000502	0.1102	53567.8	58874.5	81	0.05		0.34
1402-144	1402-144	3385	14	05	32.86733364	-14	40	18.2965890	0.00000902	0.0001769	-0.7122	56088.3	58874.4	67	0.03	0.02	
1404+286	OQ 208	400	14	07	0.39436770	+28	27	14.6885017	0.00002778	0.0004437	-0.5404	56102.4	57327.5	9	0.02	0.03	
1406-076	P 1406-076	402	14	08	56.48119812	-07	52	26.6668125	0.00000315	0.0000750	-0.3876	53561.2	58937.6	144	0.17	0.26	1.64
1406-267	1406-267	1871	14	09	50.16976168	-26	57	36.9811890	0.00000983	0.0001292	-0.7137	53652.0	58937.5	64		0.04	2.33
1413+135	P 1413+135	404	14	15	58.81752124	+13	20	23.7127842	0.00000356	0.0000732	-0.4972	53561.2	58937.6	125	0.09	0.21	
1414-596	1414-596	4214	14	17	41.63601507	-59	50	37.6089177	0.00002683	0.0002102	-0.5782	56297.5	58643.5	14			
1416-516	1416-516	4215	14	19	35.24524852	-51	54	58.5700877	0.00001455	0.0003406	-0.1062	56297.6	58643.4	12			
1418+546	GC 1418+54	408	14	19	46.59742332	+54	23	14.7871478	0.00000563	0.0000657	-0.1697	53841.1	58874.5	72	0.07		2.6
1418-481	1418-481	4216	14	21	38.64649250	-48	20	22.7969691	0.00001135	0.0002936	-0.5147	56297.6	58643.4	13			
1419-229	1419-229	4091	14	22	37.10634788	-23	08	30.1362250	0.00001095	0.0001511	-0.8024	57299.9	58937.5	37	0.06	0.09	
1424+240	1424+240	881	14	27	0.39179028	+23	48	0.0374014	0.00000388	0.0000858	-0.4443	55227.4	58937.6	103	0.07	0.04	
1424-418	P 1424-41	409	14	27	56.29753776	-42	06	19.4380426	0.00000690	0.0000876	-0.3932	54855.5	58937.4	75		0.61	
1428+422	1428+422	883	14	30	23.74165309	+42	04	36.4914028	0.00000844	0.0001361	-0.1836	57985.2	58937.6	28	0.04	0.03	
1429+249	1429+249	4217	14	31	25.88471993	+24	42	20.7047784	0.00000918	0.0001755	-0.6539	57300.1	58937.6	42	0.02	0.02	
1424-834	1424-834	4218	14	33	28.43284145	-83	41	8.7106584	0.00007077	0.0001095	0.1202	56275.7	58643.9	18			
1435-218	P 1435-218	887	14	38	9.46939162	-22	04	54.7488370	0.00000563	0.0000931	-0.5312	53652.0	58895.7	97	0.10	0.10	1.72
1437+374	1437+374	4219	14	39	20.57787304	+37	12	2.8362129	0.00001964	0.0003989	-0.7150	56893.2	58846.6	29	0.01	0.02	
1437-153	1437-153	3423	14	39	56.87205401	-15	31	50.5552553	0.00000489	0.0000985	-0.5431	53610.1	58895.7	119	0.06	0.05	1.32
1438-151	J1441-1523	4220	14	41	45.41724893	-15	23	36.2656586	0.00000732	0.0001309	-0.7305	56053.1	58895.7	78	0.03	0.03	
1445-161	P 1445-16	421	14	48	15.05414025	-16	20	24.5492923	0.00000487	0.0000964	-0.5636	54961.4	58895.7	103	0.04	0.08	
1448+762	1448+762	888	14	48	28.77914823	+76	01	11.5973585	0.00001398	0.0000494	-0.0669	55227.3	58874.6	53	0.17		
1451+270	1451+270B	4221	14	53	53.60066004	+26	48	33.4096306	0.00000399	0.0000816	-0.4796	55304.2	58937.6	104	0.07	0.04	
1451-375	P 1451-375	423	14	54	27.40974214	-37	47	33.1449766	0.00000800	0.0000943	-0.4847	53651.9	58937.4	78		0.12	1.83
1454-060	1454-060	4222	14	56	41.39253448	-06	17	43.2022419	0.00004352	0.0008376	-0.8095	56893.1	58741.1	7	0.01	0.01	
1458+718	3C 309.1	426	14	59	7.58397559	+71	40	19.8667587	0.00005499	0.0003938	-0.2018	56011.3	56234.7	4			
1456-179	J1459-1810	4223	14	59	28.76315543	-18	10	45.1865241	0.00005415	0.0008326	-0.9665	57299.9	58741.1	17	0.02	0.02	
1459+480	1459+480	890	15	00	48.65424547	+47	51	15.5381126	0.00000544	0.0000972	0.1097	53727.5	58874.6	72	0.04		1.94
1459-149	1459-149	1907	15	02	25.01742416	-15	08	52.5197354	0.00001104	0.0002059	-0.7093	58028.0	58937.5	26	0.03	0.03	
1502+106	OR 103	428	15	04	24.97978723	+10	29	39.1983334	0.00000292	0.0000685	-0.4214	53561.2	58937.5	153	0.68	0.67	2.15
1502+036	P 1502+036	429	15	05	6.47717001	+03	26	30.8123155	0.00000338	0.0000771	-0.5032	53610.1	58937.6	144	0.12	0.14	1.54
1504+377	1504+377	891	15	06	9.52998982	+37	30	51.1323966	0.00000400	0.0000686	-0.2844	53644.6	58937.6	129	0.18	0.08	2.34
1505+428	1505+428	1236	15	06	53.04186528	+42	39	23.0354951	0.00000423	0.0000631	-0.2417	53609.3	58937.6	139	0.17	0.12	2.22
1505-156	1505-156	1911	15	08	35.70161221	-15	48	31.5322747	0.00001260	0.0001979	-0.8404	55969.6	58937.5	62	0.03	0.02	
1510-089	P 1510-08	433	15	12	50.53293360	-09	05	59.8300866	0.00000317	0.0000753	-0.3940	53561.2	58937.5	136	0.75	0.70	
1509-564	1509-564	4224	15	12	55.81934038	-56	40	30.6429789	0.00001875	0.0002233	-0.4363	56297.6	58643.5	13			
1511-100	P 1511-100	434	15	13	44.89343105	-10	12	0.2652560	0.00000350	0.0000795	-0.4481	53610.1	58937.5	146	0.17	0.16	2.08
1511-210	P 1511-210	3463	15	13	56.97011435	-21	14	57.5073585	0.00000822	0.0001284	-0.7179	55738.3	58895.6	67	0.07	0.05	
1511-558	1511-558	4095	15	15	12.67285338	-55	59	32.8384635	0.00001707	0.0002134	-0.5688	56297.6	58643.8	12			
1514+004	1514+004	1283	15	16	40.21906259	+00	15	1.9088003	0.00000339	0.0000783	-0.4986	53610.1	58937.5	143	0.15	0.20	2.35
1514+197	GC 1514+19	437	15	16	56.79617471	+19	32	12.9918514	0.00000319	0.0000705	-0.4351	53610.3	58937.6	141	0.14	0.13	1.62

Source Name		ID No.	Right Ascension			Declination			RA Error (s)	Dec. Error (arcsec)	RA–Dec Corr.	Observation Epoch MJD		No. Obs.	Source Flux (Jy)		K Struct Index
B1950	Common		H	M	S	D	M	S				First	Last		10-60	10-40	
1514-241	P 1514-24	438	15	17	41.81312602	-24	22	19.4764120	0.00000487	0.0000873	-0.4551	53610.0	58937.4	107	0.35	0.41	
1519-273	P 1519-273	440	15	22	37.67597488	-27	30	10.7857944	0.00000677	0.0001044	-0.6277	53651.9	58937.5	84		0.09	1.11
1528-684	1528-684	4225	15	33	34.48846258	-68	37	19.6523296	0.00003770	0.0002233	-0.0147	56297.5	58643.5	14			
1530-536	1530-536	4226	15	34	20.66067823	-53	51	13.4230095	0.00001445	0.0002291	-0.6018	56297.6	58643.5	13			
1532+016	P 1532+01	442	15	34	52.45367735	+01	31	4.2062956	0.00000365	0.0000809	-0.5189	53561.3	58937.7	128	0.06	0.09	
1532-473	1532-473	4227	15	35	52.24146806	-47	30	22.9775736	0.00001273	0.0001464	-0.5867	56394.5	58810.8	26		0.18	
1535+231	1535+231	4228	15	37	14.50087138	+23	00	40.5110923	0.00000467	0.0001143	-0.4409	56738.2	58874.6	70	0.04	0.02	
1534-152	1534-152	1931	15	37	41.57308823	-15	27	12.4989274	0.00001454	0.0002540	-0.8156	56102.3	58874.5	40	0.03	0.02	
1538+477	1538+477	4229	15	39	34.81039161	+47	35	31.2641596	0.00000544	0.0000972	-0.1154	56907.8	58874.6	43	0.08	0.06	
1538+149	GC 1538+14	444	15	40	49.49153116	+14	47	45.8845451	0.00000344	0.0000769	-0.5034	53561.3	58937.7	119	0.10	0.12	
1544-638	1544-638	4230	15	48	30.39620045	-64	01	34.8004002	0.00001846	0.0001670	-0.0095	56297.6	58643.4	16			
1546+027	P 1546+027	446	15	49	29.43685171	+02	37	1.1631412	0.00000300	0.0000733	-0.4229	53561.3	58937.6	150	0.60	0.66	1.64
1548+056	DW 1548+05	448	15	50	35.26924885	+05	27	10.4478522	0.00000307	0.0000739	-0.4555	53603.9	58937.7	147	0.30	0.19	2.95
1550-242	1550-242	3496	15	53	31.62780619	-24	22	6.0363232	0.00000502	0.0000910	-0.4507	55451.1	58937.5	92	0.20	0.36	
1555+001	DW 1555+00	452	15	57	51.43398771	-00	01	50.4141951	0.00000361	0.0000841	-0.5621	53561.3	58937.5	120	0.06	0.11	
1556+335	1556+335	4231	15	58	55.18629467	+33	23	18.6064088	0.00000890	0.0004240	-0.1204	56738.2	58874.6	32	0.02	0.01	
1556-580	1556-580	4232	16	00	12.37742984	-58	11	2.9688013	0.00002253	0.0002330	-0.5603	56297.6	58643.8	16			
1600+335	B2 1600+33	455	16	02	7.26352144	+33	26	53.0741145	0.00000498	0.0001055	-0.3668	54961.6	58937.7	93	0.04	0.03	
1602-115	1602-115	1955	16	05	17.53165208	-11	39	26.8313458	0.00000378	0.0000859	-0.4897	55059.0	58937.6	116	0.19	0.14	
1604-333	P 1604-333	457	16	07	34.76231577	-33	31	8.9136991	0.00000961	0.0001149	-0.6861	54855.7	58937.5	71		0.10	
1606+106	P 1606+10	458	16	08	46.20319262	+10	29	7.7755675	0.00000311	0.0000739	-0.4351	53561.3	58937.7	140	0.20	0.14	
1606-398	1606-398	1121	16	10	21.87908286	-39	58	58.3294698	0.00000847	0.0001001	-0.5444	55738.3	58937.5	69		0.15	
1606-742	1606-742	4233	16	12	33.88503185	-74	23	40.1432986	0.00003729	0.0002156	0.2242	56297.7	58643.4	14			
1611+343	DA 406	460	16	13	41.06425811	+34	12	47.9086730	0.00000348	0.0000658	-0.3046	53561.4	58937.6	152	0.30	0.15	2.29
1611-710	1611-710	3523	16	16	30.64151245	-71	08	31.4541112	0.00003394	0.0001803	-0.3787	56297.7	58643.8	15			
1614+051	P 1614+051	461	16	16	37.55681921	+04	59	32.7361754	0.00000559	0.0001099	-0.6754	53561.3	58937.6	95	0.02	0.03	
1614-195	1614-195	1962	16	17	27.09307145	-19	41	32.0150324	0.00001364	0.0001892	-0.8757	55738.3	58937.5	65	0.03	0.03	
1617+229	1617+229	1123	16	19	14.82460569	+22	47	47.8510618	0.00000400	0.0000830	-0.5246	53644.8	58937.7	136	0.05	0.06	2.13
1619-680	P 1619-680	901	16	24	18.43699315	-68	09	12.4966056	0.00004437	0.0002736	-0.2922	56297.5	58643.5	12			
1622-253	P 1622-253	465	16	25	46.89163384	-25	27	38.3271599	0.00000584	0.0000956	-0.5517	53610.1	58937.6	96	0.13	0.15	1.26
1622-297	P 1622-29	466	16	26	6.02082830	-29	51	26.9716330	0.00000678	0.0000995	-0.5871	53610.1	58937.6	81		0.29	
1624-617	1624-617	1126	16	28	54.68976426	-61	52	36.3979771	0.00001828	0.0001358	-0.2636	56297.6	58643.4	16			
1636+473	1636+473	904	16	37	45.13057986	+47	17	33.8310366	0.00000437	0.0000638	-0.1809	53561.5	58895.9	102	0.22	0.17	
1637+574	P 1637+574	905	16	38	13.45632957	+57	20	23.9789056	0.00000548	0.0000588	-0.0911	53568.0	58874.6	81	0.22		1.96
1638+398	NRAO 512	472	16	40	29.63279676	+39	46	46.0282645	0.00000400	0.0000669	-0.3362	53561.4	58937.7	138	0.09	0.13	1.88
1639-062	1639-062	1982	16	42	2.17771542	-06	21	23.6952503	0.00000332	0.0000796	-0.3993	55227.5	58937.7	119	0.16	0.19	
1639-200	1639-200	1983	16	42	5.29085688	-20	07	24.8494646	0.00001737	0.0002570	-0.8747	56340.6	58852.6	39	0.03	0.02	
1642+690	1642+690	907	16	42	7.84856536	+68	56	39.7561745	0.00000885	0.0000536	-0.0454	55227.2	58874.6	55	0.21		
1642-645	1642-645	4234	16	47	37.74138361	-64	38	0.2692176	0.00001699	0.0001328	0.0088	56297.7	58643.9	16			
1647-296	P 1647-296	477	16	50	39.54409355	-29	43	46.9548846	0.00000650	0.0000983	-0.5280	53561.3	58937.7	84		0.17	
1650-157	1650-157	1989	16	53	34.20640734	-15	51	29.8880012	0.00000964	0.0001745	-0.7822	57299.2	58937.7	49	0.03	0.03	
1652+398	DA 426	479	16	53	52.21671218	+39	45	36.6086180	0.00000436	0.0000767	-0.3164	53561.5	58937.7	120	0.05	0.06	2.55
1655+077	OS 092	480	16	58	9.01146467	+07	41	27.5403815	0.00000300	0.0000721	-0.4721	53561.3	58937.7	134	0.23	0.37	
1657+265	B2 1657+26	1133	16	59	24.14946945	+26	29	36.9428996	0.00000393	0.0000816	-0.4309	55304.2	58937.7	105	0.06	0.05	
1657-261	P 1657-261	484	17	00	53.15404312	-26	10	51.7256238	0.00000564	0.0000943	-0.5249	53610.1	58937.5	89		0.30	1.48
1657-562	1657-562	1287	17	01	44.85806370	-56	21	55.9010007	0.00001813	0.0003055	-0.4079	56297.8	58643.5	14			
1659-621	1659-621	3579	17	03	36.54116485	-62	12	40.0085649	0.00001226	0.0001110	-0.1264	56297.6	58643.5	16			
1705+018	P 1705+018	485	17	07	34.41527327	+01	48	45.6990832	0.00000325	0.0000805	-0.4382	53644.8	58937.7	139	0.08	0.09	1.15
1708-250	J1711-2509	4235	17	11	23.10222922	-25	09	1.5628517	0.00001477	0.0002167	-0.8542	58027.1	58937.7	20	0.08	0.10	
1710-269	1710-269	3588	17	13	31.27558310	-26	58	52.5268450	0.00001163	0.0001505	-0.7661	54526.6	58937.6	50		0.08	3.34

Source Name		ID No.	Right Ascension			Declination			RA Error (s)	Dec. Error (arcsec)	RA–Dec Corr.	Observation Epoch MJD		No. Obs.	Source Flux (Jy)		K Struct Index
B1950	Common		H	M	S	D	M	S				First	Last		10-60	10-40	
1711-208	1711-208	2006	17	14	32.51319684	-20	53	54.2929473	0.00029076	0.0039601	-0.9852	56697.8	58601.5	4		0.01	
1717+178	GC 1717+17	489	17	19	13.04849600	+17	45	6.4370987	0.00000333	0.0000758	-0.4688	53561.4	58937.6	137	0.18	0.13	2.22
1717-618	1717-618	4236	17	21	39.01655460	-61	54	43.0182873	0.00002137	0.0001661	-0.1672	56297.6	58643.5	14			
1718-259	1718-259	3600	17	21	55.97912834	-25	58	40.6932977	0.00001077	0.0001460	-0.7611	55451.2	58895.8	54	0.16	0.09	
1722+119	1722+119	4237	17	25	4.34090070	+11	52	15.4714874	0.00000575	0.0001283	-0.6362	56738.4	58937.6	72	0.02	0.02	
1719-729	1719-729	4238	17	26	1.11240885	-72	59	59.9921357	0.00003807	0.0001093	-0.0239	56297.7	58643.5	15			
1726+455	1726+455	912	17	27	27.65083800	+45	30	39.7312059	0.00000427	0.0000603	-0.1536	53561.5	58896.0	131	0.13	0.12	1.09
1726-269	1726-269	3611	17	29	8.22389661	-26	57	50.6797367	0.00334888	0.0283390	0.9988	56710.6	56710.6	1		0.01	
1730-130	NRAO 530	495	17	33	2.70578367	-13	04	49.5484608	0.00000327	0.0000789	-0.3751	53561.3	58937.7	157	0.71	0.44	2.11
1732+389	1732+389	700	17	34	20.57856452	+38	57	51.4429543	0.00000361	0.0000616	-0.2701	53561.4	58937.8	154	0.38	0.30	1.87
1732-593	1732-593	4239	17	37	19.67254214	-59	21	41.8919394	0.00001981	0.0002597	0.2112	56394.7	58643.6	12			
1738+476	OT 465	498	17	39	57.12910302	+47	37	58.3614588	0.00000482	0.0000846	0.1665	53568.1	58874.7	73	0.07		1.97
1739-152	1739-152	2032	17	42	11.66283863	-15	17	29.1586747	0.00000487	0.0000990	-0.5655	55304.3	58937.7	98	0.10	0.07	
1741-038	P 1741-038	500	17	43	58.85613443	-03	50	4.6170282	0.00000305	0.0000750	-0.4257	53561.3	58937.7	159	0.86	0.39	2.11
1742-078	1742-078	1288	17	45	27.10494418	-07	53	3.9483709	0.00000395	0.0000909	-0.5107	53609.3	58937.7	132	0.07	0.06	2.48
1743+173	GC 1743+17	501	17	45	35.20818972	+17	20	1.4234151	0.00000361	0.0000841	-0.4933	54961.6	58937.7	100	0.08	0.06	
1745+624	1745+624	920	17	46	14.03414507	+62	26	54.7382116	0.00001045	0.0000945	-0.0218	55227.4	58853.1	48	0.02		
1743-548	1743-548	4240	17	47	24.43509750	-54	50	21.5766901	0.00002050	0.0003223	0.0824	56395.5	58643.9	13			
1746+469	1746+470	921	17	47	26.64730530	+46	58	50.9261572	0.00000468	0.0000691	-0.0761	53727.6	58937.8	111	0.07	0.08	
1749+701	1749+701	502	17	48	32.84037463	+70	05	50.7687776	0.00000932	0.0000536	-0.1144	54016.0	58874.7	64	0.15		3.27
1749+096	OT 081	503	17	51	32.81858263	+09	39	0.7281517	0.00000274	0.0000676	-0.3974	53561.4	58937.6	165	1.15	0.94	1.11
1749-299	1749-299	3636	17	52	33.10597696	-29	56	44.8816295	0.00446013	0.0735474	-0.9998	56956.1	56956.1	1		0.02	
1750-187	1750-187	3639	17	53	9.08862061	-18	43	38.5232143	0.00000811	0.0001492	-0.7069	56340.7	58937.7	61	0.05	0.03	
1751+288	GC 1751+28	504	17	53	42.47366093	+28	48	4.9387656	0.00000335	0.0000720	-0.3564	53604.1	58937.8	152	0.23	0.06	0.83
1754+155	1754+155	1141	17	56	53.10214792	+15	35	20.8261824	0.00000328	0.0000754	-0.4544	53609.3	58937.7	148	0.10	0.09	1.58
1803+784	1803+784	693	18	00	45.68395493	+78	28	4.0184731	0.00001423	0.0000431	-0.0187	53568.0	58874.6	82	0.55		2.16
1800+440	1800+440	925	18	01	32.31484485	+44	04	21.9002097	0.00000406	0.0000597	-0.1570	53561.5	58937.9	146	0.22	0.15	0.64
1759-396	1759-396	2044	18	02	42.68000019	-39	40	7.9084829	0.00000838	0.0000997	-0.5196	54366.1	58937.5	75		0.15	
1802-381	J1805-3805	4241	18	05	41.64819960	-38	05	44.5250755	0.00004406	0.0003709	-0.9548	57300.0	58937.5	23		0.05	
1803-642	1803-642	4242	18	07	54.03268179	-64	13	50.1143306	0.00001937	0.0001369	0.0697	56297.7	58643.9	17			
1804-502	1804-502	4243	18	08	13.83555296	-50	11	53.6119975	0.00001541	0.0002746	-0.0603	56394.6	58643.9	12			
1810-700	1810-700	4244	18	15	51.79964898	-70	01	38.6430011	0.00004074	0.0001649	-0.3006	56297.7	58644.0	14			
1810-745	1810-745	4245	18	16	40.07817538	-74	29	7.3459017	0.00020576	0.0016510	-0.6774	57823.2	58643.9	3			
1817+387	1817+387	2050	18	19	26.54738150	+38	45	1.7860543	0.00000438	0.0000837	-0.1693	53757.5	58896.0	102	0.04	0.04	1.66
1815-553	P 1815-554	929	18	19	45.39951119	-55	21	20.7462153	0.00001582	0.0003338	0.0249	56394.8	58643.9	11			
1817-254	1817-254	664	18	20	57.84862648	-25	28	12.5837330	0.00007830	0.0010649	-0.9786	56381.7	56697.9	4			1.83
1821+107	P 1821+10	513	18	24	2.85526449	+10	44	23.7739869	0.00000412	0.0000963	-0.5459	53561.4	58937.8	118	0.04	0.03	
1822+012	1822+012	1145	18	24	48.14343720	+01	19	34.2014233	0.00000440	0.0000956	-0.6066	55304.3	58937.8	104	0.05	0.05	
1825-214	1825-214	2059	18	28	19.48871533	-21	23	38.7870662	0.00244697	0.0247348	-0.9997	56956.0	56956.0	1		0.01	
1824-582	1824-582	3679	18	29	12.40233266	-58	13	55.1619342	0.00001244	0.0001454	-0.1629	56297.8	58643.5	17			
1827-481	1827-481	4246	18	31	41.45663237	-48	05	21.0091830	0.00001598	0.0003215	-0.0569	56394.6	58643.6	9			
1829-207	1829-207	1241	18	32	11.04654566	-20	39	48.2024561	0.00000696	0.0001194	-0.5365	54526.7	58895.7	51	0.07	0.07	2.7
1830-589	1830-589	4247	18	34	27.47227333	-58	56	36.2741508	0.00002658	0.0002606	0.0861	56297.7	58643.9	14			
1831-711	P 1831-711	934	18	37	28.71493233	-71	08	43.5546443	0.00001836	0.0001167	-0.0097	56275.6	58643.9	17			
1839+548	1839+548	3696	18	40	57.37673372	+54	52	15.9105136	0.00000664	0.0000930	0.2654	55304.3	58874.0	49	0.04		
1842-289	1842-289	2069	18	45	51.36825137	-28	52	40.2761717	0.00001480	0.0001889	-0.8416	54366.1	58937.7	53		0.04	
1845-273	1845-273	2072	18	48	47.50414952	-27	18	18.0725152	0.00001059	0.0001416	-0.7694	55451.2	58937.7	63		0.05	
1849+670	1849+670	697	18	49	16.07232727	+67	05	41.6803295	0.00000725	0.0000488	-0.0676	53568.1	58874.6	82	0.40		0.96
1851+488	J1852+4855	1151	18	52	28.54784423	+48	55	47.4812814	0.00000500	0.0000856	0.2228	55058.9	58874.5	55	0.09		
1901+319	3C 395	521	19	02	55.93889528	+31	59	41.7017520	0.00000409	0.0000773	-0.4076	53727.7	58937.8	121	0.07	0.09	

Source Name		ID No.	Right Ascension			Declination			RA Error (s)	Dec. Error (arcsec)	RA–Dec Corr.	Observation Epoch MJD		No. Obs.	Source Flux (Jy)		K Struct Index
B1950	Common		H	M	S	D	M	S				First	Last		10-60	10-40	
1903+196	1903+196	2080	19	05	36.47211123	+19	43	8.0448259	0.00000664	0.0001314	-0.6422	56417.3	58937.8	64	0.03	0.03	
1908-201	OV-213	522	19	11	9.65286762	-20	06	55.1091874	0.00000429	0.0000867	-0.4724	53561.3	58937.7	115	0.37	0.35	
1903-802	P 1904-80	937	19	12	40.01909254	-80	10	5.9467359	0.00003851	0.0000997	-0.0054	56275.6	58643.8	17			
1910-466	1910-466	4248	19	14	13.81402681	-46	31	31.9385498	0.00001751	0.0001381	-0.6503	56394.6	58643.6	34		0.08	
1914-154	1914-154	2092	19	16	52.51098550	-15	19	0.0717597	0.00000544	0.0001027	-0.6253	55304.4	58937.7	103	0.06	0.07	
1920-211	OV-235	665	19	23	32.18979107	-21	04	33.3332038	0.00000432	0.0000864	-0.4700	53561.3	58937.8	113	0.10	0.25	
1921-293	OV-236	524	19	24	51.05592879	-29	14	30.1212075	0.00000518	0.0000891	-0.4722	53561.3	58937.8	94		0.92	1.43
1922-224	1922-224	2099	19	25	39.79017868	-22	19	35.1130617	0.00001329	0.0002025	-0.8231	58027.1	58937.7	26	0.03	0.04	
1925-610	1925-610	939	19	30	6.16006350	-60	56	9.1849377	0.00002826	0.0002815	-0.5202	56394.5	58643.9	12			
1928+154	1928+154	1159	19	30	52.76699357	+15	32	34.4271886	0.00000332	0.0000786	-0.4489	53609.3	58937.8	144	0.15	0.07	1.45
1929+226	1929+226	940	19	31	24.91679294	+22	43	31.2583166	0.00000388	0.0000828	-0.4756	53561.5	58937.8	116	0.06	0.06	
1910-872	1910-872	4249	19	34	25.97427379	-87	11	59.4775694	0.00040991	0.0002785	-0.3800	56394.5	58643.8	9			
1933-400	P 1933-400	528	19	37	16.21732581	-39	58	1.5535358	0.00000771	0.0000962	-0.4414	53561.3	58937.7	75		0.13	
1935+360	1935+360	2109	19	37	31.43663720	+36	07	35.8418279	0.00000740	0.0001689	-0.3560	55451.3	58874.7	62	0.02	0.02	
1936+046	1936+046	3758	19	38	30.66955024	+04	48	11.6143164	0.00000391	0.0000868	-0.5773	55304.4	58937.8	109	0.06	0.10	
1936-155	P 1936-15	529	19	39	26.65773982	-15	25	43.0587136	0.00000444	0.0000918	-0.5429	53561.4	58937.8	131	0.07	0.14	
1935-692	1935-692	944	19	40	25.52826500	-69	07	56.9687210	0.00099362	0.0131147	0.9709	58643.6	58643.6	1			
1946-200	1946-200	3771	19	49	53.42018195	-19	57	13.3302302	0.00000514	0.0000993	-0.5294	53609.3	58937.8	94	0.11	0.06	2.78
1949-052	1949-052	2121	19	51	47.46845054	-05	09	43.9626997	0.00000355	0.0000847	-0.5062	54820.7	58937.8	120	0.19	0.15	
1953-325	P 1953-325	3776	19	56	59.45525551	-32	25	46.0073949	0.00000789	0.0001072	-0.6248	55451.2	58937.7	71		0.12	
1954-388	P 1954-388	533	19	57	59.81924860	-38	45	6.3564215	0.00000670	0.0000930	-0.4280	53609.3	58937.7	87		0.38	
1958-179	OV-198	534	20	00	57.09042320	-17	48	57.6728265	0.00000350	0.0000811	-0.3799	53561.4	58937.8	149	0.48	0.61	0.2
2000+472	2000+472	1246	20	02	10.41824687	+47	25	28.7738385	0.00000537	0.0000789	0.0071	53694.3	58874.7	88	0.05	0.08	2.04
1959-639	1959-639	4250	20	04	29.47801882	-63	47	23.3099534	0.00004365	0.0002944	0.0354	56394.5	58643.8	10			
2007+659	2007+659	3789	20	07	28.77113273	+66	07	22.5355323	0.00000827	0.0000605	0.0932	55304.4	58874.5	52	0.11		
2008-159	P 2008-159	536	20	11	15.71091507	-15	46	40.2538901	0.00000349	0.0000829	-0.3817	53561.4	58937.8	144	0.36	0.27	
2013+163	2013+163	1164	20	16	13.86003773	+16	32	34.1128647	0.00000346	0.0000784	-0.4519	53652.2	58937.9	139	0.08	0.10	1.18
2021+317	2021+317	957	20	23	19.01735840	+31	53	2.3061626	0.00000387	0.0000753	-0.3735	53609.5	58937.9	125	0.10	0.08	2.73
2021+222	2021+222	3811	20	23	23.16023380	+22	23	52.5253326	0.00000968	0.0001785	-0.6937	56102.6	58937.8	63	0.02	0.02	
2022-077	2022-077	3813	20	25	40.66039702	-07	35	52.6890508	0.00000345	0.0000840	-0.4674	55059.1	58937.8	123	0.26	0.28	
2029+024	2029+022	1293	20	31	47.25111255	+02	39	37.2834088	0.00000444	0.0000969	-0.6040	55262.5	58937.8	109	0.04	0.04	
2029+121	P 2029+121	542	20	31	54.99427374	+12	19	41.3398465	0.00000338	0.0000813	-0.4777	53561.5	58895.9	149	0.07	0.06	
2030-689	2030-689	3827	20	35	48.87638142	-68	46	33.8408302	0.00002575	0.0001488	0.1227	56275.7	58643.9	16			
2031-662	2031-662	4251	20	35	51.52201650	-66	02	7.5333088	0.00004867	0.0006633	-0.1723	56394.7	57957.3	6			
2033-219	2033-219	2143	20	36	51.17271190	-21	46	36.7508070	0.00001532	0.0002335	-0.8654	55178.0	58937.8	51	0.03	0.02	
2037+511	3C 418	545	20	38	37.03476564	+51	19	12.6625288	0.00000494	0.0000702	0.2416	53644.5	58874.6	78	0.46		
2036-109	J2039-1046	4252	20	39	0.71041333	-10	46	41.8630912	0.00000567	0.0001175	-0.6804	57299.2	58937.8	64	0.05	0.06	
2047-266	2047-266	2151	20	50	24.69382874	-26	28	18.0580303	0.00000743	0.0001124	-0.6363	55451.3	58937.8	71		0.04	
2048+312	2048+312	1248	20	50	51.13148389	+31	27	27.3737005	0.00000439	0.0001005	-0.3215	53798.6	58937.0	100	0.05	0.03	2.19
2051-204	2051-204	2152	20	54	22.07243970	-20	16	16.8197634	0.00000748	0.0001231	-0.7036	55451.3	58895.9	69	0.05	0.06	
2052+239	2052+239	4253	20	54	29.53309346	+24	07	33.7650371	0.00000944	0.0001819	-0.6777	56892.4	58937.8	57	0.02	0.02	
2054-377	2054-377	960	20	57	41.60345838	-37	34	2.9908249	0.00000857	0.0001007	-0.5470	53652.2	58937.7	82		0.14	1.16
2059+034	P 2059+034	553	21	01	38.83415350	+03	41	31.3206882	0.00000318	0.0000785	-0.4566	54961.6	58937.9	129	0.44	0.59	
2059-786	2059-786	963	21	05	44.96131770	-78	25	34.5472160	0.00004162	0.0001349	0.0084	56275.7	58643.4	14			
2103+213	2103+213	2159	21	06	10.81818648	+21	35	35.9963345	0.00000498	0.0001004	-0.5803	55451.3	58937.9	96	0.04	0.04	
2106+143	J2108+1430	964	21	08	41.03215250	+14	30	27.0124657	0.00000384	0.0000857	-0.5373	55227.6	58937.9	112	0.06	0.06	
2106-413	P 2106-413	554	21	09	33.18854223	-41	10	20.6059924	0.00001238	0.0001187	-0.6689	53609.3	58895.8	82		0.07	
2112-144	2112-144	2165	21	15	18.43554407	-14	16	43.3724098	0.00000621	0.0001144	-0.7198	55451.3	58937.8	89	0.05	0.06	
2113+293	B2 2113+29B	555	21	15	29.41346427	+29	33	38.3668083	0.00000348	0.0000783	-0.2951	53561.6	58937.9	140	0.22	0.09	
2112-556	2112-556	4254	21	16	29.81615564	-55	27	20.4449362	0.00003710	0.0005628	0.4282	56394.8	58643.5	11			

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B1950	Common		H	M	S	D	M	S				First	Last		10-60	10-40	
2109-811	2109-811	965	21	16	30.84562902	-80	53	55.2232464	0.00004454	0.0000957	-0.0106	56297.5	58643.9	17			
2116-068	2116-068	3859	21	18	43.24215325	-06	36	17.9992887	0.00000530	0.0001445	-0.5196	55451.3	58895.9	70	0.04	0.03	
2117-614	2117-614	1175	21	21	4.07416923	-61	11	24.6249797	0.00003741	0.0003017	0.5773	56394.8	58643.4	11			
2121+547	2121+547	1176	21	23	5.31346940	+55	00	27.3252703	0.00000643	0.0000767	-0.0151	55227.5	58874.5	53	0.06		
2121+053	OX 036	557	21	23	44.51741022	+05	35	22.0928134	0.00000338	0.0000785	-0.4958	53652.2	58937.9	142	0.18	0.32	
2120-309	2120-309	2171	21	23	48.59955140	-30	46	5.4396534	0.00002742	0.0003051	-0.9391	57299.2	58895.9	29		0.04	
2123-463	2123-463	3866	21	26	30.70421563	-46	05	47.8926864	0.00001389	0.0001166	-0.5246	56395.6	58810.1	45		0.07	
2126-158	P 2126-15	559	21	29	12.17586970	-15	38	41.0416476	0.00000459	0.0000947	-0.5269	53609.3	58937.8	101	0.12	0.11	
2128-123	P 2128-12	563	21	31	35.26176510	-12	07	4.7957463	0.00000362	0.0000846	-0.4351	53609.4	58937.8	139	0.18	0.13	
2131-021	P 2131-021	564	21	34	10.30959016	-01	53	17.2390258	0.00000318	0.0000773	-0.4501	53561.5	58937.9	154	0.25	0.23	
2132-638	2132-638	4255	21	36	22.07471572	-63	35	51.0381211	0.00002531	0.0002434	0.1345	56297.7	58643.8	14			
2134+004	P 2134+004	565	21	36	38.58638776	+00	41	54.2119641	0.00000328	0.0000794	-0.4720	53561.5	58937.9	128	0.18	0.22	
2136+141	OX 161	567	21	39	1.30926663	+14	23	35.9921069	0.00000354	0.0000812	-0.4983	53561.5	58937.9	143	0.10	0.11	
2139-249	2139-249	3880	21	42	30.95903663	-24	44	38.8325027	0.00001565	0.0001873	-0.8943	55451.3	58937.7	66	0.03	0.04	
2143-298	J2146-2935	4256	21	46	5.75216739	-29	35	11.4116760	0.00002383	0.0002661	-0.9268	57299.2	58895.9	31		0.04	
2143-156	OX-173	570	21	46	22.97931828	-15	25	43.8859234	0.00000390	0.0000859	-0.4609	54016.0	58937.9	122	0.15	0.22	1.63
2141-784	2141-784	4257	21	47	5.84077664	-78	12	21.9119352	0.00003261	0.0001159	-0.0831	56275.7	58643.8	18			
2144+092	OX 074	571	21	47	10.16296730	+09	29	46.6721472	0.00000337	0.0000800	-0.4885	53561.5	58937.8	132	0.09	0.11	
2145+067	P 2145+06	572	21	48	5.45866639	+06	57	38.6038989	0.00000290	0.0000727	-0.4128	53561.5	58937.8	161	0.48	0.41	
2146-682	2146-682	4258	21	50	13.39072567	-68	02	50.4079366	0.00006073	0.0002305	0.2441	56522.7	58643.9	8			
2150+173	2150+173	968	21	52	24.81939936	+17	34	37.7949995	0.00000388	0.0000987	-0.4225	53561.6	58938.0	119	0.08	0.03	2.37
2153-760	2153-760	4259	21	57	59.22497355	-75	49	53.6076279	0.00003389	0.0001435	-0.1792	56297.5	58643.9	15			
2154-838	2154-838	4260	22	02	19.23761238	-83	38	11.8286166	0.00006109	0.0001016	0.0652	56275.7	58643.8	17			
2200+420	VRO 42.22.01	581	22	02	43.29139307	+42	16	39.9798639	0.00000391	0.0000616	-0.0663	53561.6	58937.9	152	0.40	0.25	
2201+171	2201+171	1180	22	03	26.89368976	+17	25	48.2476240	0.00000323	0.0000782	-0.4146	53604.1	58937.9	150	0.30	0.22	1.73
2200-617	2200-617	4261	22	03	59.63793318	-61	30	22.0108200	0.00004875	0.0002848	-0.1701	56395.6	58643.9	10			
2204-007	2204-007	3907	22	06	43.28260069	-00	31	2.4952562	0.00000393	0.0000921	-0.5809	56088.6	58937.9	86	0.09	0.14	
2204-540	P 2204-54	971	22	07	43.73325587	-53	46	33.8206721	0.00001285	0.0002627	0.1270	56275.6	58643.6	15			
2205-002	J2207-0002	4262	22	07	55.24706766	-00	02	15.0858807	0.00004714	0.0009818	-0.7556	57299.3	58874.7	7	0.01	0.01	
2208-137	2208-137	2202	22	11	24.09943451	-13	28	9.7239788	0.00000394	0.0000912	-0.4836	55304.5	58937.9	107	0.13	0.08	
2209+236	P 2209+236	588	22	12	5.96632865	+23	55	40.5434846	0.00000380	0.0000801	-0.4161	53561.6	58937.9	139	0.07	0.08	
2214+350	GC 2214+35	590	22	16	20.00991906	+35	18	14.1800418	0.00000475	0.0000881	-0.3865	53757.7	58937.9	107	0.05	0.03	
2223-114	2223-114	3934	22	25	43.71841352	-11	13	40.6988831	0.00003818	0.0005912	-0.9372	55451.4	58839.1	26		0.01	
2223-052	3C 446	594	22	25	47.25929348	-04	57	1.3909492	0.00000340	0.0000786	-0.4458	53561.5	58937.9	133	0.09	0.31	
2227-088	P 2227-08	596	22	29	40.08432769	-08	32	54.4357664	0.00000327	0.0000795	-0.4337	53561.5	58937.9	155	0.59	0.68	
2229+695	2229+695	694	22	30	36.46972772	+69	46	28.0768275	0.00001138	0.0000575	0.0021	55059.0	58874.0	53	0.06		
2227-399	P 2227-399	597	22	30	40.27855670	-39	42	52.0673084	0.00000885	0.0001026	-0.5327	55451.3	58937.8	76		0.08	
2227-627	2227-627	4263	22	31	7.91977930	-62	31	19.3443230	0.00004933	0.0002856	0.2396	56394.5	58643.9	11			
2232-488	P 2232-488	973	22	35	13.23655417	-48	35	58.7951144	0.00001190	0.0002921	0.0389	56275.6	58643.7	13			
2234+282	GC 2234+28	601	22	36	22.47084283	+28	28	57.4128675	0.00000352	0.0000720	-0.3313	53561.7	58937.9	124	0.36	0.40	
2233-234	2233-234	2217	22	36	26.23869530	-23	09	26.5975768	0.00000596	0.0001011	-0.5653	55451.3	58937.8	80	0.12	0.06	
2233-148	P 2233-148	600	22	36	34.08713961	-14	33	22.1898091	0.00000377	0.0000830	-0.4300	53561.6	58937.9	118	0.13	0.26	
2236-572	2236-572	3945	22	39	12.07588172	-57	01	0.8399155	0.00001256	0.0001916	0.0044	56394.8	58643.8	15			
2239+096	2239+096	1296	22	41	49.71731197	+09	53	52.4448215	0.00000387	0.0000885	-0.4807	53694.2	58874.7	126	0.02	0.03	1.54
2243-563	2243-563	4264	22	46	16.79256365	-56	07	46.0053441	0.00001764	0.0002596	0.1220	56394.8	58643.8	13			
2244-372	2244-372	1190	22	47	3.91729449	-36	57	46.3043712	0.00000805	0.0000991	-0.5378	55451.3	58937.8	81		0.10	
2245-128	2245-128	3953	22	47	52.64102386	-12	37	19.7218069	0.00000780	0.0001255	-0.7699	55451.3	58937.9	81	0.02	0.05	
2245-328	P 2245-328	608	22	48	38.68571583	-32	35	52.1885678	0.00000638	0.0000947	-0.4969	53561.5	58937.8	80		0.13	
2251+158	3C 454.3	611	22	53	57.74796298	+16	08	53.5609751	0.00000604	0.0001182	-0.5920	54282.6	58937.9	105	1.24	0.92	
2251-419	J2254-4139	4265	22	54	36.69753852	-41	39	40.2553257	0.00003492	0.0002587	-0.9125	57299.3	58895.9	29		0.05	

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B1950	Common		H	M	S	D	M	S				First	Last		10-60	10-40	
2251-597	2251-597	4266	22	54	56.82957982	-59	26	0.6878488	0.00001859	0.0002066	-0.0048	56394.8	58643.8	15			
2252-090	P 2252-089	614	22	55	4.23979582	-08	44	4.0218946	0.00000604	0.0001184	-0.6042	55793.4	58937.9	80	0.02	0.03	
2253+417	GC 2253+41	615	22	55	36.70786474	+42	02	52.5325443	0.00000445	0.0000772	-0.0093	54960.9	58937.1	102	0.07	0.05	
2254+074	GC 2254+07	617	22	57	17.30312069	+07	43	12.3024039	0.00000374	0.0000843	-0.4621	53561.6	58937.0	121	0.05	0.05	
2254+024	P 2254+024	616	22	57	17.56308871	+02	43	17.5115753	0.00000375	0.0000892	-0.5136	53561.6	58938.0	125	0.08	0.07	
2255-282	P 2255-282	619	22	58	5.96286216	-27	58	21.2570742	0.00000536	0.0000898	-0.4813	53561.5	58937.9	96		0.61	
2256-084	2256-084	2234	22	59	0.68883879	-08	11	3.0461387	0.00002323	0.0003426	-0.9448	55451.4	58895.9	53	0.01	0.02	
2309+454	J2311+4543	1197	23	11	47.40899434	+45	43	56.0163557	0.00000474	0.0000734	0.0134	53694.4	58895.1	109	0.07	0.09	1.61
2312-505	2312-505	4267	23	15	44.33031897	-50	18	39.7045271	0.00001043	0.0002238	-0.0956	56297.6	58643.8	14			
2315-172	2315-172	2242	23	18	11.36137372	-16	59	29.1888746	0.00000808	0.0001334	-0.7464	56341.0	58937.9	76	0.03	0.04	
2316+238	2316+238	4002	23	18	33.96785970	+24	04	39.7491727	0.00000534	0.0001091	-0.5632	55451.5	58937.9	94	0.04	0.03	
2318+049	GC 2318+04	627	23	20	44.85659844	+05	13	49.9523636	0.00000353	0.0000803	-0.4882	53561.6	58937.0	146	0.10	0.14	
2319+272	B2 2319+27	629	23	21	59.86224084	+27	32	46.4436598	0.00000367	0.0000768	-0.3553	53561.6	58937.9	123	0.17	0.18	
2320-035	P 2320-035	633	23	23	31.95374643	-03	17	5.0240063	0.00000322	0.0000790	-0.4139	53561.5	58937.0	133	0.34	0.46	
2325+093	2325+093	1299	23	27	33.58055357	+09	40	9.4625456	0.00000313	0.0000752	-0.4070	53568.3	58938.0	156	0.30	0.36	0.73
2326-502	2326-502	4268	23	29	20.88174171	-49	55	40.6548922	0.00001317	0.0002665	0.1699	56297.6	58643.7	13			
2328+107	P 2328+10	636	23	30	40.85225639	+11	00	18.7094150	0.00000381	0.0000846	-0.5248	53561.6	58937.9	125	0.09	0.07	
2331-240	2331-240	979	23	33	55.23781892	-23	43	40.6585923	0.00000469	0.0000892	-0.4885	53561.5	58937.9	104	0.17	0.39	
2332-531	2332-531	4269	23	34	44.91671985	-52	51	19.6329323	0.00002230	0.0004769	-0.5271	56297.6	57851.3	11			
2335-027	P 2335-027	644	23	37	57.33906640	-02	30	57.6293962	0.00000338	0.0000798	-0.4428	53609.5	58937.0	148	0.13	0.10	
2344+092	P 2344+09	649	23	46	36.83855166	+09	30	45.5149488	0.00000365	0.0000832	-0.4920	53561.6	58938.0	131	0.18	0.14	
2344-514	2344-514	4033	23	47	19.86408080	-51	10	36.0652680	0.00001440	0.0002896	0.1883	56297.6	58643.7	15			
2345-500	2345-500	4270	23	47	43.68518995	-49	46	27.8752562	0.00001644	0.0003892	-0.2556	56297.6	58643.7	12			
2345+061	2345+061	4271	23	48	31.77065620	+06	24	59.7822213	0.00000847	0.0003321	-0.4698	56892.5	58847.0	39	0.02	0.01	
2346+385	2346+385	4034	23	49	20.82655619	+38	49	17.5583423	0.00000421	0.0000726	-0.2488	53609.6	58937.1	140	0.09	0.12	2.11
2346-498	2346-498	4272	23	49	25.37887558	-49	32	26.5482643	0.00002016	0.0003852	0.4085	56395.8	58643.8	11			
2351+456	2351+456	981	23	54	21.68026577	+45	53	4.2364760	0.00000545	0.0000747	-0.0694	54933.5	58937.1	99	0.04	0.07	
2351-154	2351-154	695	23	54	30.19515533	-15	13	11.2131458	0.00000525	0.0000972	-0.6087	53561.6	58937.9	111	0.05	0.10	
2353+816	2353+816	1252	23	56	22.79395035	+81	52	52.2552071	0.00002122	0.0000452	0.0199	53568.0	58874.5	80	0.12		1.34
2354-021	2354-021	4040	23	57	25.13792907	-01	52	15.5095807	0.00000605	0.0001222	-0.5733	55451.5	58937.0	80	0.03	0.03	
2355-534	P 2355-534	983	23	57	53.26603257	-53	11	13.6895950	0.00001280	0.0002267	-0.0222	56275.6	58643.8	15			
2355-106	P 2355-106	658	23	58	10.88237737	-10	20	8.6115608	0.00000362	0.0000822	-0.4353	53561.6	58937.0	144	0.08	0.15	
2357-318	2357-318	2273	23	59	35.49152971	-31	33	43.8248220	0.00000993	0.0001217	-0.7096	54366.3	58937.9	78		0.05	

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