

INTERNAL REPORT

Toward an extended catalog of pointing calibrators for (high-frequency) observations with the SRT

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Abstract

The present work is a first effort aimed at compiling an extended catalog of sources suitable for pointing/focus calibration purposes at the SRT. The report provides a brief summary of the main issues related to the pointing/focus tasks and the details of the source selection criteria. The table enclosed collects the list of pointing/focus calibrator candidates together with their main parameters and the constraints associated with their use. Then, we briefly introduce a list of sources for flux and polarization calibration typically used at other facilities. The present work has to be considered as the necessary first step toward forthcoming observational campaigns aimed at observing and monitoring the listed sources in order to validate them as suitable calibrators for the SRT.

1. Introduction

In order to perform correct radioastronomical measurements, it is fundamental to make sure that the stability of the pointing is granted. This is typically reached by obtaining a good pointing model of the antenna at different frequencies through observations of a set of suitable compact and bright calibrators. This model is continuously improved by regular observations of pointing calibrators. In addition, especially for high frequency measurements ($\nu > 10$ GHz), the pointing may (should) be regularly adjusted during the observations by implementing on-the-fly corrections. Such corrections are computed from the offsets (in azimuth and elevation) with respect to an optimal pointing. These offsets are provided by an 'ad hoc' fitting procedure of a cross-scan measurement on a pointing calibrator close to the target of the ongoing experiment (see Appendix A for a basic schedule for Cross Scan observations with the SRT of a calibrator). Since, however, at high frequencies it is not always easy to find a suitable pointing calibrator (compact and bright enough), having an extended catalog of validated such sources will be particularly useful for the observer.

The focus of the telescope is another relevant aspect that needs to be kept under control since temperature gradients or other atmospheric effects can degrade its stability influencing the quality of the data acquired. Also in this case, suitable calibrators are used to correct the focus parameters of the antenna. Since these calibrators need to have the same characteristics as those used for pointing, the aforementioned catalog will then constitute a relevant tool for focusing as well.

2. The catalog compilation

In the framework of the aforementioned pointing/focus calibration tasks, we have compiled a list of putative suitable (bright and with Dec. $> -40^\circ$) sources for the SRT by taking advantage of the existing GBT Pointing Calibrator Catalog. The most recent version of the Catalog, PCALS4.5, is available at the website "<ftp://ftp.cv.nrao.edu/NRAO-staff/jcondon/PCALS4.5>" and collects more than 7000 sources. A description of the main parameters of the catalog are reported in Condon (2009). From PCALS4.5 we have extracted only those sources whose code was labeled 'P', namely the PTCS "gold standard" sources. These sources do satisfy three criteria: i) their 0.7 cm flux densities must be at least $S = 0.4$ Jy; ii) they must have very accurate core positions measured by long-baseline interferometers; iii) they must be sufficiently compact for the GBT. These characteristics are aiming at selecting optimal pointing calibrator candidates for high-frequency observations (at which the pointing issue is most important) also for an antenna, like the SRT, which is less sensitive than the GBT. Obviously, the possibility exists to enlarge our catalog by going back to PCALS4.5 and testing also the 'lower-ranked' sources with code 'X'.

The resulting catalog of 'gold standard' sources (570) has then been cross-checked with that used at the 100-m telescope at Effelsberg and, for completeness, also with the list of calibrators used at the 32-m Medicina telescope.

As expected, most of the sources used at Effelsberg and Medicina (labeled in Table 1 with an initial 'E' and/or 'M', respectively) were present also in the GBT 'gold standard' catalog with few exception. Indeed, there are also 13 sources routinely used at Effelsberg and/or Medicina classified as 'X' in the PCALS4.5, hence, not fulfilling the three aforementioned criteria. Nevertheless, we decided to include also these sources in our catalog as they are already successfully used for pointing calibration purposes. The final catalog of putative pointing calibrators for the SRT then collects 583 sources (Table 1).

3. The proposed catalog

Table 1 reports a list of pointing calibrator candidates for the SRT, derived as described in the previous section. Following Condon (2009), individual columns indicate:

Column 1. J2000 IAU name, format JHHMM+DDMM.

Column 2. J2000 right ascension.

Column 3. J2000 declination.

Column 4. Minimum telescope half-power beam width HPBW (arcsec) for which the calibrator is suitable. This mainly refers to the compactness of the source as a requirement to be a suitable calibrator.

Column 5. Maximum telescope HPBW (arcsec) for which the calibrator is suitable. This accounts for the possible confusion by nearby discrete sources or extended radio structures.

Column 6. L-band (20 cm, 1.4 GHz) flux density (Jy). Nearly all of these are 1.4 GHz NVSS flux densities.

Column 7. C-band (6 cm, 4.9 GHz) flux density (Jy) from various observations.

Column 8. X-band (3.6 cm, 8.6 GHz) flux density (Jy) from various observations.

Column 9. U-band (2 cm, 15 GHz) flux density (Jy) from the VLA Calibrator Manual (<http://www.aoc.nrao.edu/~gtaylor/csource.html>).

Column 10. K-band (1.3 cm, 23 GHz) flux density (Jy) from the WMAP5 source catalog (preferred) or the VLA Calibrator Manual.

Column 11. Ka-band (0.9 cm, 33 GHz) flux density (Jy) from the WMAP5 source catalog.

Column 12. Q-band (0.7 cm, 41 GHz) flux density (Jy) from the WMAP5 source catalog (preferred) or the VLA Calibrator Manual.

Column 13. V-band (0.5 cm, 61 GHz) flux density (Jy) from the WMAP5 source catalog.

Column 14. W-band (0.3 cm, 94 GHz) flux density (Jy) from the WMAP5 source catalog.

Column 15. GBT Calibrator code: P for a PTCS gold standard source (see criteria in previous section).

Further details on each column item and a more thorough explanation on the catalog can be obtained from Condon (2009).

In Table 1, source names are shown according to a color code that expresses the suitability of the target as calibrator for a certain band of observations. At the SRT there are three first light receivers: the L-P dual-band receiver, the C-band mono-feed receiver, and the K band 7-feed receiver. The SRT beamwidths at L, C, and K bands are $\theta_L \approx 756''$, $\theta_C \approx 168''$, and $\theta_K \approx 50''$, respectively (the P band is not included in the following discussion since, due to the extremely large beamwidth, $\theta_P \approx 56'$, it very seldom requires finer pointing corrections). Therefore, when considering the minimum and maximum telescope HPBW for which the calibrator is suitable as reported in Table 1 (columns 4 and 5), it is possible to discriminate among the sources in the following way:

- **blue:** suitable for L, C, and K bands pointing
- **green:** suitable for C and K bands pointing
- **red:** suitable for K band pointing
- **black:** suitable but not optimal for K band pointing (HPBW of the telescope close to the maximum limit) and possibly usable for higher-frequency bands $\nu > 22$ GHz
- ~~**strike-out:**~~ possibly suitable for higher-frequency bands $\nu > 40$ GHz

4. Brief notes on the flux density and polarization calibration

While a correct pointing and focus of the telescopes are fundamental to ensure a correct recovering of the target parameters under investigation, a correct flux calibration is also required to ensure a proper scale factor for the data acquired (from arbitrary quantity, counts, to usable flux or temperature units, e.g., Jy or K). Without entering into the details of the different calibration procedures and the corresponding software and hardware requirements (for details see, e.g., Rohlfs & Wilson 1996, or any other textbook on Radioastronomy), a number of compact relatively-stable astronomical sources, whose flux densities are regularly monitored, is used to provide a scale for the flux calibration. In Table 2, we have collected a list of sources that are typically used at the Effelsberg, GBT, and Medicina telescopes to calibrate the flux scale by comparing the relative measurements to the absolute scale of Baars et al. (1977) and Ott et al. (1994)¹. This list may constitute a useful sample for flux density calibration purposes at the SRT. Needless to say, additional sources from Table 1, may also be monitored in order to verify their flux density stability on different time ranges. Such sources would allow us to extend the available flux calibrator list to lower flux density ranges (useful for, e.g., receiver gain stability estimates), as the calibrators in Table 2 are, by definition, among the brightest objects.

¹A very recent accurate flux density scale from 1 to 50 GHz is reported in Perley & Butler (2013a)

One last, but certainly not least, issue that may be useful to mention, in the framework of the telescope calibration, is the need to consider, when necessary, also polarization calibration (e.g., Turlo et al. 1985; Cenacchi et al. 2009). This calibration typically implies to recover the absolute position angle of polarized emission and to determine the instrumental polarization (the 'leakage terms'). Both quantities can be obtained by observing one of the primary polarization standards, (3C48, 3C138, 3C147, and 3C286; in bold-faced format in Table 3), i.e., bright sources whose polarization characteristics are well studied and assessed (integrated polarization properties of these sources from 1 to 50 GHz have been very recently reported in Perley & Butler 2013b), at least once during an observing run. The leakage terms can also be estimated by either a single observation of a bright unpolarized unresolved source (in italic-faced format in Table 3) or measurements of an unresolved polarized source (e.g., NRAO150) over a wide range (at least 60 degrees) in parallactic angle. Table 3 lists the handful of sources typically used for either one, or both, of the aforementioned purposes. Since, however, all the polarization parameters strongly depend on the observational details (observing frequency, bandwidth, etc...), characterizing the polarization details of these sources with the SRT will be essential to calibrate forthcoming polarization experiments.

5. Final remarks and Expected Follow-ups

The present report describes a putative catalog of compact and bright sources we have recently compiled, in an attempt to broaden the number of pointing/focus calibrators for SRT observations, especially at high-frequency. The quality of the sources (with the exception of the well-known ones, also included in the list) as point/focus calibrators still needs to be validated by an 'ad hoc' observational campaign that should, ultimately, lead to an extended 'official' catalog for the SRT, likely in the form of an accessible database. Indeed, this database should collect for each source of the pointing/focus, flux, and polarization calibrator lists, all the main parameters and their possible variation over time as measured by SRT observational campaigns (e.g., fit results, flux density monitoring values, polarization characteristics, etc...), thus, finally providing a basic 'calibration benchmark' for the observer.

Acronyms

GBT	Green bank Telescope
HPBW	Half Power Beam Width
IAU	International Astronomical Union
NED	NASA/IPAC Extragalactic Database
NRAO	National Radio Astronomy Observatory
NVSS	NRAO VLA Sky Survey
PTCS	Precise Telescope Control System
VLA	Very large Array
WMAP	Wilkinson Microwave Anisotropy Probe

References

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Bartolini et al., in preparation (for a draft of the user manual, see "<http://www.ira.inaf.it/~bartolini/schedulecreator/schedulecreator/>")
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Appendix A

In the following, we give an example of the two necessary files to produce a schedule to perform a simple Cross Scan at C band with the SRT on a bright and compact source (e.g., 3C286) with the 'Schedule Creator v. 0.3' (Bartolini et al. in prep.).

- The **configuration file** ('3c286_conf.txt'):

```
projectID = Point
observer = Any
scheduleLabel = 3C286
# MED or SRT
radiotelescope = SRT
receiver = C
# fits or mbfits
outputFormat = fits
# default repetitions value for each scan
repetitions = 1
# default tsys value for each scan
tsys = 0

# File name of the target specs in this same directory
targetsFile = 3c286_targets.txt

[backend]
# integration period in ms
integration = 40
# sampling interval in ms
samplingInterval = 10.0
# bandwidth in MHz, possible values are:
# 300, 730, 1250, 2000
bandwidth = 730

[scans]

#CROSSSCANNAME = CROSS FRAME LENGTH SPEED
CS = CROSS EQ 1.0d 3.0
EqCross1_5 = CROSS EQ 1.0d 5.0
HorCross1_3 = CROSS HOR 1.0d 3.0
```

- The **targets file** ('3c286_targets.txt')

```
# Comment lines to exclude them from the schedule computation
#LABEL SCANTYPE TARGET_FRAME LONGITUDE LATITUDE [tsys, repetitions, offset_lon, offset_lat,
3C286 CS EQ 13:31:08.2879h +30:30:32.958
```

In the next lines, we also give examples of the outputs produced by the 'schedule creator' (version 0.3), i.e., the four files of the schedule. This is what is needed to confidently detect the source, to assess its compactness and flux

density, and, through 'ad hoc' pointing and focus procedures, to implement the correct pointing/focus offsets in the system.

Command typed:

```
> schedulecreator -c 3c286_conf.txt .
```

Files produced:

- The **schedule file** ('3C286.scd')

```
PROJECT: Point
OBSERVER: Any
SCANLIST: 3C286.lis
PROCEDURELIST: 3C286.cfg
BACKENDLIST: 3C286.bck
MODE: SEQ
SCANTAG: 1
INITPROC: PROCEDURE_INIT
```

```
SC: 1 3C286 STD:MANAGEMENT/FitsZilla
1_1 0.000000 2 NULL PROCEDURE_TSYS
1_2 20.000000 1 NULL PROCEDURE_WAIT=2.0
1_3 20.000000 3 NULL PROCEDURE_WAIT=2.0
1_4 20.000000 5 NULL PROCEDURE_WAIT=2.0
1_5 20.000000 7 NULL PROCEDURE_WAIT=2.0
```

- The **backend configuration file** ('3C286.bck')

```
STD:BACKENDS/TotalPower{
integration=40
setSection=0,*,730.000000,*,*,0.000100,*
setSection=1,*,730.000000,*,*,0.000100,*
enable=1;1
}
```

- The **scan file** ('3C286.lis')

```
#3C286
1 OTF 3C286 +13:31:08.2879h +30:30:32.9580 0.0d 1.0d EQ EQ LON CEN INC 20.0 -EQOFFS 0.0d 0.0d
2 SIDERREAL Tsys EQ +13:31:08.2879h +30:30:32.9580 2000 -EQOFFS 0.0d -0.765d
3 OTF 3C286 +13:31:08.2879h +30:30:32.9580 0.0d 1.0d EQ EQ LON CEN DEC 20.0 -EQOFFS 0.0d 0.0d
5 OTF 3C286 +13:31:08.2879h +30:30:32.9580 1.0d 0.0d EQ EQ LAT CEN INC 20.0 -EQOFFS 0.0d 0.0d
7 OTF 3C286 +13:31:08.2879h +30:30:32.9580 1.0d 0.0d EQ EQ LAT CEN DEC 20.0 -EQOFFS 0.0d 0.0d
```

- The **configuration file** ('3C286.cfg')

```
PROCEDURE_INIT{
nop
}
PROCEDURE_TSYS{
wait=2.000000
tsys
wait=1
}
PROCEDURE_WAIT(1){
wait=$1
}
```

Table 1. A list of pointing/focus calibrator candidates for the SRT. Details are provided in Sect. 3. Flux densities of DR21 are derived from the absolute spectrum provided by Dent (1972). Sources E0305+03, E0951+699, and 3C 409 are used at Effelsberg but are not part of the GBT catalog; their flux densities have been taken from NED. If there is no usable value for the flux density (or for any other parameter) available, the value is listed as either a 0 or a – sign.

IAU NAME HHMM+DDMM	RA (J2000) HH MM SS.SSSS	DEC DDD MM SS.SSS	MIN (arcsec)	MAX (arcsec)	S20 Jy	S6 Jy	S3.5 Jy	S2 Jy	S1.3 Jy	S0.9 Jy	S0.7 Jy	S0.5 Jy	S0.3 Jy	Code
0004-1148	00:04:04.9149	-11:48:58.385	0	45	0.46	0.83	0.65	0.	0.68	0.72	0.	0.	0.60	P
0005+5428	00:05:04.3635	+54:28:24.926	0	45	0.17	0.23	0.39	0.48	0.	0.	0.46	0.	0.	P
0005+3820	00:05:57.1754	+38:20:15.148	0	90	0.57	0.80	1.1	0.67	0.	0.	0.	0.	0.73	P
0006-0623	00:06:13.8928	-06:23:35.335	0	180	2.05	1.30	1.60	1.10	2.08	1.51	2.2	1.36	1.26	P
0010+1058	00:10:31.0058	+10:58:29.504	0	45	0.10	0.27	0.44	0.35	1.1	2.44	2.77	2.15	1.85	P
0010+1724	00:10:33.9906	+17:24:18.761	0	180	0.92	0.98	0.95	0.70	0.	0.	0.5	0.	0.	P
0011+0823	00:11:35.2696	+08:23:55.587	0	45	0.63	0.40	0.37	0.	0.	0.	0.42	0.	0.	P
0012-3954	00:12:59.9080	-39:54:25.836	0	45	0.49	2.02	2.01	0.	1.61	1.3	0.8	0.8	0.67	P
0013+4051	00:13:31.1302	+40:51:37.144	0	45	1.65	0.80	0.67	0.7	0.81	1.15	0.6	1.36	1.03	P
E0014+6117	00:14:48.8154	+61:17:43.852	0	540	4.04	1.85	1.20	0.90	0.	0.	0.	0.89	0.	P
0017+5312	00:17:51.7598	+53:12:19.121	0	45	0.39	0.69	0.64	0.6	0.	0.	0.4	0.	0.	P
0019+2021	00:19:37.8545	+20:21:45.644	0	90	0.98	0.71	1.18	1.1	1.0	1.1	0.5	0.	0.	P
0019+7327	00:19:45.7864	+73:27:30.017	0	45	1.25	1.30	1.48	1.40	0.	0.	0.80	0.	0.48	P
0025+3919	00:25:26.1577	+39:19:35.439	0	180	0.71	0.81	0.54	0.60	0.	0.	0.4	0.	0.	P
0029+0554	00:29:45.8964	+05:54:40.695	0	45	0.29	0.33	0.38	0.	1.1	1.3	0.9	0.6	0.	P
0030+7037	00:30:14.4164	+70:37:40.042	0	45	0.65	0.54	0.43	0.	0.	0.	0.6	0.	0.	P
0038-2459	00:38:14.7354	-24:59:02.235	0	45	0.41	0.58	0.95	0.	1.13	0.80	0.8	1.1	0.49	P
0040-0146	00:40:57.6115	-01:46:32.025	0	90	0.57	0.60	0.57	0.	0.47	0.	0.58	0.	0.	P
0042+2320	00:42:04.5451	+23:20:01.061	0	180	1.27	0.85	1.18	0.70	0.	0.	0.4	0.	0.	P
0042+5708	00:42:19.4517	+57:08:36.585	0	180	1.13	0.65	0.83	0.7	0.	0.	0.8	0.	0.	P
0046+2456	00:46:07.8292	+24:56:32.607	0	45	0.17	0.21	0.20	0.	0.	0.	0.66	0.	0.	P
0048+3157	00:48:47.1414	+31:57:25.085	0	45	0.29	0.30	0.28	0.	0.	0.	0.48	0.	0.	P
0049+0237	00:49:43.2359	+02:37:03.778	0	45	0.43	0.29	0.52	0.5	0.	0.	0.5	0.	0.	P
0050-0929	00:50:41.3173	-09:29:05.210	0	45	0.81	1.12	1.28	1.70	0.51	1.0	0.8	0.8	0.91	P
0051-0650	00:51:08.2097	-06:50:02.228	0	90	0.90	0.58	0.72	0.	1.28	1.30	1.59	1.55	1.30	P
0056+1625	00:56:55.2941	+16:25:13.338	0	45	0.12	0.35	0.60	0.9	0.	0.	1.1	0.	0.	P
0059+0006	00:59:05.5149	+00:06:51.621	0	30	2.51	1.35	0.96	0.70	0.	0.	0.42	0.	0.	P
0102+5824	01:02:45.7623	+58:24:11.136	0	45	0.85	1.2	2.70	2.30	0.	2.04	2.40	1.67	1.27	P
0104-2416	01:04:58.2053	-24:16:28.445	0	45	0.23	0.54	0.51	0.	0.40	1.43	0.	1.01	0.77	P
0106-2718	01:06:26.0820	-27:18:11.824	0	45	0.46	0.80	0.72	0.	0.47	0.	0.	0.	0.59	P
0108+0135	01:08:38.7710	+01:35:00.317	0	540	2.62	1.9	2.05	4.50	1.9	3.48	2.64	2.55	1.94	P
0109+6133	01:09:46.3390	+61:33:30.450	0	45	0.30	0.41	0.44	0.	0.	0.	0.40	0.	0.	P
0112+2244	01:12:05.8247	+22:44:38.786	0	45	0.39	0.70	0.54	0.50	0.	0.	0.6	0.	0.	P
0112+3208	01:12:50.3276	+32:08:17.548	0	90	0.68	0.41	0.38	0.	0.	0.	0.51	0.	0.93	P
0113+4948	01:13:27.0068	+49:48:24.043	0	45	0.67	0.74	0.50	0.73	0.	0.	0.6	0.6	0.63	P
0113+0222	01:13:43.1449	+02:22:17.316	0	15	0.49	0.56	0.54	0.60	0.	0.	0.49	0.	0.	P
0115-0127	01:15:17.0999	-01:27:04.577	0	360	1.08	1.16	2.00	1.70	0.74	1.2	1.1	0.	0.	P
0116-1136	01:16:12.5219	-11:36:15.434	0	540	1.79	1.40	1.58	1.10	0.97	1.06	1.1	1.11	1.02	P
0118-2141	01:18:57.2621	-21:41:30.139	0	30	0.45	0.88	0.91	0.	0.88	1.16	0.8	1.34	0.86	P
0120-2701	01:20:31.6633	-27:01:24.652	0	45	0.93	1.03	0.81	0.70	0.62	0.72	0.52	0.	0.63	P

Table 1. continued.

IAU NAME	RA (J2000)	DEC	MIN	MAX	S20	S6	S3.5	S2	S1.3	S0.9	S0.7	S0.5	S0.3	Code
HHMM+DDMM	HH MM SS.SSSS	DDD MM SS.SSS	(arcsec)	(arcsec)	Jy	Jy	Jy	Jy	Jy	Jy	Jy	Jy	Jy	
0121+1149	01:21:41.5950	+11:49:50.413	0	15	1.18	0.79	1.10	1.06	1.2	1.92	1.84	0.7	1.09	P
E0121+0422	01:21:56.8616	+04:22:24.734	0	45	1.07	0.85	1.63	1.20	0.	0.	0.55	0.	0.92	P
0122+2502	01:22:38.8159	+25:02:31.793	0	180	0.71	0.53	0.73	0.89	0.	0.	0.48	0.	0.	P
0125-0005	01:25:28.8437	-00:05:55.931	0	45	1.54	1.30	1.36	1.5	1.16	1.12	0.9	0.9	0.	P
0128+4901	01:28:08.0647	+49:01:05.977	0	45	0.21	0.41	0.36	0.	0.	1.21	0.	1.05	1.05	P
0132-1654	01:32:43.4874	-16:54:48.521	0	45	0.83	1.58	1.46	0.60	1.43	1.82	1.86	1.18	1.15	P
0134-3843	01:34:32.0382	-38:43:33.514	0	180	0.57	0.44	0.51	0.	0.69	0.81	0.	0.	0.50	P
E0136+4751	01:36:58.5948	+47:51:29.100	0	360	1.14	1.88	1.80	1.60	3.8	4.95	4.52	3.96	3.72	P
E0137-2430	01:37:38.3463	-24:30:53.885	0	45	1.18	1.56	1.41	0.90	1.21	2.49	2.54	2.89	2.13	P
EM0137+3309	01:37:41.2994	+33:09:35.132	0	720	16.02	5.48	3.25	1.78	1.13	0.	0.8	0.	0.	P (3C48)
0141-0928	01:41:25.8320	-09:28:43.673	0	15	0.66	1.35	0.85	1.60	0.76	0.84	0.	0.	0.82	P
0145-2733	01:45:03.3945	-27:33:34.328	0	45	0.92	1.00	0.79	0.50	0.57	1.09	0.	1.09	0.98	P
0149+0555	01:49:22.3708	+05:55:53.568	0	180	0.91	0.89	1.16	0.75	1.0	0.7	0.6	0.	0.	P
0152+2207	01:52:18.0590	+22:07:07.700	0	45	1.04	1.43	1.08	1.30	1.2	1.01	1.1	1.27	1.02	P
0203+1134	02:03:46.6570	+11:34:45.409	0	180	0.78	0.96	0.76	0.50	0.	0.	0.6	0.	0.	P
E0204+1514	02:04:50.4139	+15:14:11.043	0	540	4.07	3.70	2.32	2.00	1.3	1.02	1.1	1.1	0.	P
0204-1701	02:04:57.6743	-17:01:19.840	0	45	1.22	1.25	1.14	0.90	1.78	0.84	1.0	0.8	0.	P
0205+3212	02:05:04.9253	+32:12:30.095	0	180	0.66	1.47	0.76	1.40	1.6	2.17	1.82	1.16	0.92	P
0211+1051	02:11:13.1775	+10:51:34.790	0	45	0.32	0.38	0.35	0.	0.	1.08	0.	0.	1.07	P
E0217+7349	02:17:30.8133	+73:49:32.621	0	360	2.27	2.30	2.18	2.10	0.	2.92	2.26	1.80	1.56	P
0217+0144	02:17:48.9547	+01:44:49.699	0	45	0.75	1.3	1.60	1.40	1.3	2.45	2.59	1.78	0.	P
0219+0120	02:19:07.0244	+01:20:59.865	0	45	0.48	0.67	0.68	0.70	0.	0.	0.43	0.	0.	P
0221+3556	02:21:05.4733	+35:56:13.791	0	540	1.71	1.07	1.28	1.10	1.2	1.32	0.9	0.9	0.69	P
0222+4302	02:22:39.6115	+43:02:07.798	0	45	2.30	0.99	0.73	0.	0.	0.	1.4	1.0	0.91	P
0222-3441	02:22:56.4016	-34:41:28.730	0	180	0.68	1.23	1.23	0.60	1.02	0.97	0.6	0.	0.	P
0224+0659	02:24:28.4281	+06:59:23.341	0	30	0.77	0.75	1.34	1.40	0.	1.40	1.94	0.	1.27	P
0226+3421	02:26:10.3331	+34:21:30.286	0	360	2.89	1.63	1.28	1.1	0.	0.92	0.	0.	0.	P
0228+6721	02:28:50.0514	+67:21:03.029	0	540	1.54	1.15	2.12	2.30	0.	1.12	1.16	1.30	0.97	P
0231+1322	02:31:45.8940	+13:22:54.716	0	90	1.56	2.20	1.97	2.50	1.3	1.61	1.43	0.9	0.	P
0232+2628	02:32:27.6250	+26:28:38.596	0	180	0.67	0.44	0.37	0.	0.	0.	0.58	0.	0.	P
E0237+2848	02:37:52.4056	+28:48:08.990	0	360	2.20	2.30	4.65	2.50	3.8	2.08	1.72	1.34	1.30	P
E0238+1636	02:38:38.9301	+16:36:59.274	0	540	1.94	1.73	1.30	3.30	1.5	0.97	1.33	1.51	1.46	P
0239-0234	02:39:45.4722	-02:34:40.914	0	45	0.30	1.12	0.90	1.00	0.89	0.88	0.	0.	0.73	P
0239+0416	02:39:51.2630	+04:16:21.411	0	180	0.89	0.70	0.60	0.80	0.	0.	0.54	0.	0.	P
E0240-2309	02:40:08.1745	-23:09:15.730	0	720	6.26	3.01	2.12	0.9	0.90	0.	0.30	0.	0.	X
0241-0815	02:41:04.7985	-08:15:20.751	0	180	0.91	1.15	3.10	0.80	1.20	0.90	0.7	0.	0.	P
0242+1101	02:42:29.1708	+11:01:00.728	0	360	1.66	1.05	1.08	1.00	0.	1.16	0.9	0.89	1.10	P
0244+6228	02:44:57.6968	+62:28:06.514	0	45	0.36	0.41	1.88	1.25	0.	0.	0.72	0.	1.11	P
0253+3835	02:53:08.8881	+38:35:24.998	0	45	0.66	0.46	0.45	0.	0.	0.	0.41	0.	0.	P
0259-0019	02:59:28.5161	-00:19:59.974	0	45	0.23	0.50	0.82	0.	0.96	1.4	0.8	0.	0.	P
0303+4716	03:03:35.2422	+47:16:16.275	0	180	0.96	2.47	1.43	2.90	0.	1.29	1.54	1.53	1.08	P
0304+6821	03:04:22.0038	+68:21:37.474	0	90	1.21	1.24	0.74	0.6	0.	0.	0.4	0.	0.	P
E 0305+03	03:08:26.2238	+04:06:39.300	–	–	7.40	3.44	5.50	1.62	1.52	1.2	1.2	1.0	0.4	X

Table 1. continued.

IAU NAME HHMM+DDMM	RA (J2000) HH MM SS.SSSS	DEC DDD MM SS.SSS	MIN (arcsec)	MAX (arcsec)	S20 Jy	S6 Jy	S3.5 Jy	S2 Jy	S1.3 Jy	S0.9 Jy	S0.7 Jy	S0.5 Jy	S0.3 Jy	Code
0309+1029	03:09:03.6235	+10:29:16.340	0	45	0.51	1.02	0.71	1.10	1.1	1.04	1.1	1.34	1.01	P
0310+3814	03:10:49.8799	+38:14:53.837	0	45	0.24	0.20	0.4	0.	0.	0.	0.79	0.	0.	P
0312+0133	03:12:43.6028	+01:33:17.538	0	45	0.46	0.92	0.47	0.	0.9	0.8	0.56	0.	0.	P
E0318+1628	03:18:57.8026	+16:28:32.698	0	720	8.03	2.95	1.63	0.70	0.	0.	0.19	0.	0.	X
EM0319+4130	03:19:48.1601	+41:30:42.103	0	540	22.83	23.3	21.70	20.70	11.3	16.93	13.06	10.99	9.33	P(3C84)
0325+4655	03:25:20.3038	+46:55:06.635	0	45	0.23	0.31	0.36	0.46	0.	0.	0.85	0.	0.	P
0325+2224	03:25:36.8143	+22:24:00.365	0	180	0.53	1.18	1.21	1.14	0.8	1.03	1.1	1.05	0.89	P
0329-2357	03:29:54.0755	-23:57:08.773	0	45	0.68	1.45	1.64	1.00	1.46	0.88	1.0	0.9	0.65	P
0336+3218	03:36:30.1075	+32:18:29.342	0	360	2.68	1.61	1.37	1.56	0.	2.89	2.61	2.13	1.75	P
0336-1302	03:36:35.0357	-13:02:04.660	0	45	0.38	0.53	0.	0.	0.45	0.92	0.6	0.	0.47	P
E0339-0146	03:39:30.9377	-01:46:35.803	0	180	2.42	2.82	2.08	2.35	2.21	1.49	1.63	1.13	1.34	P
0340-2119	03:40:35.6078	-21:19:31.172	0	360	1.08	1.25	1.27	1.00	1.04	0.81	0.9	1.2	0.54	P
0348-2749	03:48:38.1445	-27:49:13.565	0	45	0.84	1.45	1.67	2.20	1.33	0.94	0.8	1.2	0.57	P
0348-1610	03:48:39.2707	-16:10:17.752	0	45	0.44	0.87	0.96	0.	0.94	0.	0.8	0.7	0.84	P
0349+4609	03:49:18.7415	+46:09:59.658	0	180	0.92	1.00	1.00	0.90	0.	0.	0.6	0.	0.	P
0351-1153	03:51:10.9769	-11:53:22.664	0	180	0.50	0.54	0.50	0.	0.60	0.	0.6	0.	0.	P
0357+2319	03:57:21.6098	+23:19:53.826	0	45	0.18	0.29	0.34	0.80	0.	0.89	0.	0.	0.48	P
0358+5606	03:58:30.1793	+56:06:44.493	0	180	0.71	0.63	0.62	0.	0.	0.	0.	0.	0.97	P
0359+6005	03:59:02.6399	+60:05:22.068	0	45	0.95	0.98	0.83	0.6	0.	1.18	1.36	1.46	1.20	P
E0359+5057	03:59:29.7472	+50:57:50.161	0	45	4.30	10.10	5.10	10.50	0.	15.11	11.99	9.37	7.87	P
0359+3220	03:59:44.9129	+32:20:47.155	0	45	0.65	0.73	0.76	1.1	0.	0.	0.8	0.	0.	P
0401+0413	04:01:19.9128	+04:13:34.408	0	45	0.11	0.17	0.24	0.	0.	0.	0.63	0.	0.	P
0402-3147	04:02:21.2660	-31:47:25.945	0	90	0.68	0.63	0.59	0.40	0.47	0.82	0.53	0.	0.61	P
0403+2600	04:03:05.5860	+26:00:01.502	0	180	0.94	1.27	0.74	0.90	0.	1.49	1.29	1.24	0.66	P
0403-3605	04:03:53.7499	-36:05:01.913	0	360	1.15	2.27	3.44	4.20	4.01	3.59	4.06	4.46	4.31	P
0405-1308	04:05:34.0034	-13:08:13.691	0	90	4.22	2.5	2.1	1.9	1.58	1.8	1.5	1.4	0.68	P
0406-3826	04:06:59.0353	-38:26:28.042	0	90	0.86	1.43	1.53	2.00	1.17	1.07	1.03	1.01	0.67	P
0407+0742	04:07:29.0870	+07:42:07.500	0	45	0.30	0.18	0.39	0.	0.	0.	0.54	0.	0.	P
0409+1217	04:09:22.0087	+12:17:39.847	0	45	0.43	0.88	0.36	0.85	0.	0.	0.5	0.	0.	P
0410+7656	04:10:45.6057	+76:56:45.301	0	540	5.62	2.79	2.21	1.46	1.0	0.81	0.7	0.7	0.52	P
0414+3418	04:14:37.2557	+34:18:51.207	0	90	1.92	1.50	1.23	0.97	0.	0.	0.5	0.	0.	P
0415+4452	04:15:56.5265	+44:52:49.683	0	45	0.15	0.20	0.29	0.	0.	0.	0.5	0.	0.	P
0416-1851	04:16:36.5444	-18:51:08.340	0	540	1.25	0.56	0.85	1.10	0.58	0.83	0.	0.	0.56	P
0422+0219	04:22:52.2146	+02:19:26.931	0	45	0.68	0.87	0.97	0.9	0.	0.	0.7	0.	0.	P
E0423-0120	04:23:15.8007	-01:20:33.065	0	540	2.73	3.70	4.25	4.30	6.00	8.65	7.85	7.24	6.51	P
0423+4150	04:23:56.0097	+41:50:02.712	0	45	1.76	1.46	1.12	0.72	0.	0.97	1.45	0.	0.89	P
0424-3756	04:24:42.2437	-37:56:20.784	0	45	0.48	1.57	1.71	1.30	1.69	1.2	1.3	0.76	0.62	P
0424+0036	04:24:46.8420	+00:36:06.329	0	45	0.49	0.65	0.64	0.6	1.5	0.94	0.	0.	0.79	P
0427+0457	04:27:47.5705	+04:57:08.325	0	180	0.77	0.45	0.42	0.40	0.	0.	0.4	0.	0.	P
0428-3756	04:28:40.4243	-37:56:19.580	0	45	0.75	1.66	1.72	1.30	1.85	3.17	3.44	2.94	2.55	P
E0432+4138	04:32:36.5026	+41:38:28.448	0	540	9.83	3.70	2.60	1.60	0.	0.88	0.6	0.	0.	P
0433+0521	04:33:11.0955	+05:21:15.619	0	15	3.43	3.60	3.30	3.10	2.4	2.06	1.86	1.92	1.62	P
0442-0017	04:42:38.6607	-00:17:43.419	0	540	1.77	1.17	0.86	1.1	1.08	1.03	1.1	0.8	1.01	P

Table 1. continued.

IAU NAME HHMM+DDMM	RA (J2000) HH MM SS.SSSS	DEC DDD MM SS.SSS	MIN (arcsec)	MAX (arcsec)	S20 Jy	S6 Jy	S3.5 Jy	S2 Jy	S1.3 Jy	S0.9 Jy	S0.7 Jy	S0.5 Jy	S0.3 Jy	Code
0449+1121	04:49:07.6711	+11:21:28.596	0	45	0.85	0.96	1.08	1.1	0.	1.16	0.	1.09	1.06	P
0449+6332	04:49:23.3105	+63:32:09.434	0	30	0.43	0.40	0.47	1.0	0.	0.	0.8	0.	0.	P
0453-2807	04:53:14.6468	-28:07:37.327	0	90	2.54	2.86	3.23	1.1	1.79	2.26	2.30	1.80	1.98	P
0457-2324	04:57:03.1792	-23:24:52.020	0	45	1.73	3.99	5.74	1.50	3.84	1.81	1.84	1.52	1.54	P
0457+0645	04:57:07.7099	+06:45:07.260	0	45	0.53	0.60	0.43	0.40	0.	0.80	1.0	0.7	0.83	P
0501-0159	05:01:12.8098	-01:59:14.256	0	45	2.26	2.15	3.70	3.10	1.10	1.00	1.0	0.9	0.92	P
0502+0609	05:02:15.4459	+06:09:07.494	0	180	0.92	0.86	0.72	0.62	0.	0.	0.8	0.	0.	P
0502+1338	05:02:33.2195	+13:38:10.958	0	180	0.55	0.54	0.42	0.10	0.	0.	0.5	0.	0.	P
0502+4139	05:02:37.9877	+41:39:19.337	0	45	0.24	0.72	0.80	0.	0.7	0.	0.60	0.	0.	P
0502+2516	05:02:58.5826	+25:16:24.242	0	540	5.77	2.37	0.	0.	0.	0.	0.	0.	0.	X
0505+0459	05:05:23.1847	+04:59:42.724	0	180	0.99	0.67	0.64	0.50	0.	0.	0.	0.	0.83	P
0509+0541	05:09:25.9644	+05:41:35.333	0	180	0.54	1.03	0.68	0.7	0.	0.	0.	0.	0.	P
0509+1011	05:09:27.4570	+10:11:44.600	0	45	0.46	0.50	0.45	0.70	0.	0.	0.	0.	0.	P
0510+1800	05:10:02.3691	+18:00:41.581	0	90	0.70	0.7	0.82	1.00	0.	0.	1.0	0.	0.84	P
0512+4041	05:12:52.5440	+40:41:43.603	0	180	0.88	1.29	1.1	0.	0.	0.87	1.39	0.	0.80	P
0513-2159	05:13:49.1143	-21:59:16.092	0	90	0.65	1.13	1.26	1.00	0.94	1.1	0.5	0.	0.	P
0519+0848	05:19:10.8113	+08:48:56.717	0	45	0.20	0.46	0.16	0.	0.	0.	0.40	0.	0.84	P
0521+1638	05:21:09.8860	+16:38:22.051	0	45	8.60	3.78	2.52	1.56	0.	1.29	0.	0.	0.82	P(3C138)
0522-3627	05:22:57.9846	-36:27:30.850	0	720	15.62	9.07	6.57	0.	3.91	4.94	4.76	4.15	4.31	P
0525-2338	05:25:06.5059	-23:38:10.806	0	45	0.40	0.81	0.89	0.	0.79	1.13	1.37	0.	0.65	P
0530+1331	05:30:56.4167	+13:31:55.149	0	180	1.56	4.30	2.48	3.20	0.	2.03	1.68	1.34	0.67	P
0532+0732	05:32:38.9985	+07:32:43.345	0	360	2.73	2.30	2.08	2.20	0.	0.	2.07	1.28	1.02	P
0533+4822	05:33:15.8657	+48:22:52.807	0	45	0.43	0.59	0.54	0.6	0.	1.16	0.9	1.64	1.32	P
0539+1433	05:39:42.3659	+14:33:45.561	0	45	0.43	0.38	0.39	0.50	0.	0.	0.	0.	0.	P
0539-2839	05:39:54.2814	-28:39:55.947	0	180	0.86	1.28	1.14	0.90	0.68	0.63	0.8	0.7	0.78	P
0541-0541	05:41:38.0833	-05:41:49.428	0	90	0.88	1.25	0.98	1.30	2.05	0.	0.7	0.	0.	P
0542+4951	05:42:36.1379	+49:51:07.233	0	540	22.88	7.94	4.84	2.78	1.7	1.47	1.3	0.7	0.58	P(3C147)
0552+3754	05:52:17.9368	+37:54:25.281	0	45	0.35	0.34	0.37	0.46	0.	0.	0.7	0.	0.	P
0552+0313	05:52:50.1014	+03:13:27.243	0	180	0.66	0.78	0.74	0.80	0.	0.	0.40	0.	0.	P
0555+3948	05:55:30.8056	+39:48:49.165	0	540	1.52	5.00	6.20	2.80	3.0	3.14	1.60	1.33	0.90	P
0559+2353	05:59:32.0331	+23:53:53.926	0	45	0.40	1.05	0.95	0.80	0.	0.	0.4	0.	0.	P
0605+4030	06:05:50.8553	+40:30:08.103	0	180	0.80	0.74	0.78	1.1	0.	0.76	0.7	0.	0.58	P
0607+6720	06:07:52.6716	+67:20:55.409	0	45	0.42	0.68	0.58	0.50	1.2	0.9	0.6	0.6	0.	P
0607-0834	06:07:59.6992	-08:34:49.978	0	180	1.91	2.70	3.22	2.10	1.17	2.22	2.25	2.24	1.70	P
0608-2220	06:08:59.6868	-22:20:20.955	0	45	0.68	0.99	1.21	0.60	1.00	1.38	1.22	0.83	0.79	P
0609-1542	06:09:40.9495	-15:42:40.672	0	180	2.74	3.76	4.91	9.0	3.98	3.83	2.70	2.42	2.05	P
0617+5701	06:17:16.9225	+57:01:16.423	0	30	0.46	0.26	0.31	0.	0.	0.	0.5	0.	0.	P
0620-2515	06:20:32.1169	-25:15:17.484	0	180	1.21	1.16	1.12	0.	0.84	0.5	0.6	0.	0.	P
0626+8202	06:26:03.0061	+82:02:25.567	0	45	0.68	1.00	0.68	0.5	0.	0.63	0.	0.	0.26	P
0629-1959	06:29:23.7618	-19:59:19.723	0	180	0.68	0.98	1.33	0.60	1.26	1.06	1.25	1.04	0.68	P
0634-2335	06:34:59.0009	-23:35:11.956	0	45	0.57	1.03	1.26	0.	1.03	0.98	0.	0.75	0.64	P
0638+5933	06:38:02.8719	+59:33:22.214	0	45	0.25	0.56	0.55	0.	0.	0.75	0.41	0.	0.	P
0639+7324	06:39:21.9611	+73:24:58.040	0	180	0.90	0.77	0.77	1.1	0.8	0.81	1.14	1.39	1.27	P

Table 1. continued.

IAU NAME	RA (J2000)	DEC	MIN	MAX	S20	S6	S3.5	S2	S1.3	S0.9	S0.7	S0.5	S0.3	Code
HHMM+DDMM	HH MM SS.SSSS	DDD MM SS.SSS	(arcsec)	(arcsec)	Jy	Jy	Jy	Jy	Jy	Jy	Jy	Jy	Jy	
0641-0320	06:41:51.1335	-03:20:48.500	0	45	0.82	0.62	0.71	0.	0.54	0.	0.58	0.	0.	P
0643+0857	06:43:26.4449	+08:57:38.013	0	45	0.54	0.45	0.33	0.	0.28	1.61	0.	0.	1.01	P
0646+4451	06:46:32.0259	+44:51:16.590	0	45	0.45	0.70	2.20	2.50	2.9	2.62	1.75	1.86	1.27	P
0648-3044	06:48:14.0964	-30:44:19.659	0	180	0.90	0.77	0.71	0.85	0.74	0.	0.5	0.	0.	P
0648-1744	06:48:28.4985	-17:44:05.440	0	540	1.05	1.00	0.	0.	1.11	0.78	0.8	0.7	0.52	P
0650-1637	06:50:24.5818	-16:37:39.725	0	45	1.78	3.14	3.57	2.70	2.50	2.07	2.01	1.37	0.93	P
0653-0625	06:53:00.5987	-06:25:32.520	0	30	0.40	0.	0.72	0.	0.50	0.	0.44	0.	0.62	P
0653+3705	06:53:58.2828	+37:05:40.606	0	180	0.80	0.60	0.91	0.50	0.	0.	0.6	0.	0.	P
0656-0323	06:56:11.1223	-03:23:06.638	0	45	0.40	0.58	1.18	0.	0.	0.	1.16	0.93	0.91	P
0700+1709	07:00:01.5255	+17:09:21.701	0	180	0.65	0.79	0.95	1.00	0.	1.45	1.0	0.93	0.85	P
0702+2644	07:02:31.7918	+26:44:11.051	0	45	0.49	0.51	0.45	0.	0.	0.	0.40	0.	0.	P
0703-0051	07:03:19.1067	-00:51:04.949	0	90	1.53	1.10	0.90	0.	0.60	0.	0.55	0.	0.	P
0710-3850	07:10:43.6362	-38:50:37.036	0	180	0.88	0.48	0.46	0.	0.40	0.	0.	0.87	0.81	P
0710+4732	07:10:46.1049	+47:32:11.142	0	180	1.02	0.80	0.70	0.70	0.	0.	0.7	0.7	0.49	P
0717+4538	07:17:51.8524	+45:38:03.261	0	45	0.38	0.39	0.57	0.	0.	0.95	0.9	0.98	0.	P
0719+3307	07:19:19.4209	+33:07:09.711	0	45	0.23	0.32	0.17	0.	0.	0.76	1.35	1.12	0.94	P
0721+0406	07:21:23.9099	+04:06:44.213	0	30	0.31	0.36	0.57	0.5	0.	0.	0.6	0.	0.	P
E0721+7120	07:21:53.4484	+71:20:36.363	0	45	0.73	0.60	0.66	0.90	1.6	2.38	1.92	2.53	2.28	P
0725+1425	07:25:16.8077	+14:25:13.746	0	180	1.07	0.80	0.78	0.80	0.	0.	0.7	0.6	0.	P
0725-0054	07:25:50.6399	-00:54:56.544	0	15	1.40	1.1	1.1	1.1	1.80	2.72	2.61	3.11	3.00	P
0728+5701	07:28:49.6316	+57:01:24.374	0	45	0.48	0.48	0.63	0.	0.	0.	0.	0.	0.	P
0730-1141	07:30:19.1124	-11:41:12.600	0	90	2.76	2.6	3.97	2.50	6.65	7.46	6.55	5.09	4.37	P
0731-2341	07:31:06.6670	-23:41:47.827	0	360	1.05	1.54	1.84	0.	1.39	0.	0.86	0.	0.	P
0733+5022	07:33:52.5205	+50:22:09.062	0	180	0.77	0.86	0.73	0.83	0.	1.04	0.8	1.0	0.85	P
0735-1735	07:35:45.8124	-17:35:48.502	0	45	2.98	1.75	1.43	1.00	0.	0.	0.4	0.	0.	P
E0738+1742	07:38:07.3937	+17:42:18.998	0	360	2.26	2.20	3.50	1.90	1.3	0.77	0.9	1.0	0.	P
E0739+0137	07:39:18.0338	+01:37:04.618	0	540	1.96	1.80	2.00	2.05	1.7	0.99	2.0	1.25	1.20	P
E0741+3112	07:41:10.7033	+31:12:00.228	0	720	2.28	1.6	2.10	1.0	1.2	1.13	0.8	0.	0.	P
0742+4900	07:42:02.7489	+49:00:15.609	0	45	0.40	0.68	0.48	0.	0.	0.	0.	0.	0.	P
E0745+1011	07:45:33.0595	+10:11:12.692	0	360	3.51	3.50	2.95	2.20	1.1	1.07	0.7	0.	0.	P
0745-0044	07:45:54.0823	-00:44:17.539	0	45	0.66	1.30	1.95	1.20	1.27	0.98	0.7	0.7	0.	P
0747-3310	07:47:19.6883	-33:10:47.127	0	45	0.73	0.73	0.73	0.80	0.95	1.10	0.	0.	0.67	P
0748-1639	07:48:03.0880	-16:39:50.160	0	90	0.80	1.29	1.32	0.	0.76	1.11	0.51	0.	0.	P
0748+2400	07:48:36.1092	+24:00:24.110	0	180	0.96	0.90	1.22	0.85	0.	1.09	0.8	1.07	0.80	P
0750+1231	07:50:52.0457	+12:31:04.828	0	180	1.49	1.50	1.14	3.6	2.7	4.54	3.90	3.18	2.69	P
0753+5352	07:53:01.3845	+53:52:59.637	0	45	0.80	1.50	1.42	1.60	1.0	1.0	1.3	0.	0.	P
0754+4823	07:54:45.6718	+48:23:50.747	0	15	0.26	0.23	0.19	0.	0.	0.69	0.	0.90	0.94	P
0757+0956	07:57:06.6429	+09:56:34.852	0	15	0.95	1.25	1.28	1.50	1.3	1.25	1.32	1.35	1.39	P
0804-2749	08:04:51.4511	-27:49:11.320	0	30	0.85	0.71	1.01	0.	0.89	0.	0.	0.	0.	P
0805+6144	08:05:18.1851	+61:44:23.658	0	45	0.83	1.05	0.95	0.61	0.7	0.5	0.6	0.	0.	P
0808-0751	08:08:15.5360	-07:51:09.886	0	360	1.60	0.9	2.6	2.6	0.77	2.41	2.55	2.11	2.16	P
0808+4950	08:08:39.6662	+49:50:36.530	0	180	1.12	1.60	1.08	1.00	0.	0.	0.8	0.	0.	P
0808+4052	08:08:56.6520	+40:52:44.888	0	180	0.58	0.40	1.17	1.15	0.	0.80	0.	0.	0.84	P

Table 1. continued.

IAU NAME HHMM+DDMM	RA (J2000) HH MM SS.SSSS	DEC DDD MM SS.SSS	MIN (arcsec)	MAX (arcsec)	S20 Jy	S6 Jy	S3.5 Jy	S2 Jy	S1.3 Jy	S0.9 Jy	S0.7 Jy	S0.5 Jy	S0.3 Jy	Code
E0813+4813	08:13:36.0518	+48:13:02.262	0	720	15.01	4.50	0.	0.	1.0	1.0	0.	0.	0.	X
0816-2421	08:16:40.4123	-24:21:06.571	0	45	0.19	0.40	0.54	0.	0.58	1.06	0.6	0.93	0.63	P
E0818+4222	08:18:15.9996	+42:22:45.414	0	180	1.09	1.80	1.40	1.80	0.	1.91	2.00	0.91	0.99	P
0820-1258	08:20:57.4476	-12:58:59.169	0	540	1.10	1.00	0.60	1.20	0.43	0.	0.6	0.	0.	P
0823+2223	08:23:24.7591	+22:23:03.288	0	540	2.27	1.39	1.24	1.0	1.1	1.31	0.8	0.	0.	P
E0824+5552	08:24:47.2363	+55:52:42.669	0	180	1.45	1.00	1.58	0.90	0.	0.	1.5	0.	0.	P
0824+3916	08:24:55.4838	+39:16:41.904	0	45	1.48	2.	2.97	1.38	1.2	1.01	1.27	0.91	0.75	P
0825+0309	08:25:50.3383	+03:09:24.520	0	90	1.40	1.10	1.23	2.70	1.6	0.96	1.6	1.6	0.63	P
0826-2230	08:26:01.5729	-22:30:27.202	0	45	0.52	0.97	1.03	1.00	0.92	0.75	0.6	0.69	0.60	P
0828-3731	08:28:04.7802	-37:31:06.280	0	720	2.58	2.30	2.44	2.50	1.60	0.	1.40	0.	0.68	P
0830+2410	08:30:52.0861	+24:10:59.820	0	180	0.74	0.60	0.44	1.5	1.3	1.25	1.49	1.03	1.02	P
0831+0429	08:31:48.8769	+04:29:39.085	0	180	1.24	1.00	1.24	0.	0.	0.	0.9	0.	0.53	P
0834+5534	08:34:54.9041	+55:34:21.070	0	360	8.28	5.60	3.30	1.60	0.9	0.87	0.	0.	0.	P
E0836-2016	08:36:39.2152	-20:16:59.503	0	360	1.97	3.92	3.79	1.10	2.67	1.79	1.58	1.6	0.40	P
0836-2233	08:36:50.7687	-22:33:10.088	0	45	0.46	0.31	0.35	0.	0.46	1.40	0.	0.80	0.48	P
0837+5825	08:37:22.4097	+58:25:01.845	0	45	0.69	1.20	0.56	1.00	1.1	1.1	0.	0.7	0.	P
0837+2454	08:37:40.2456	+24:54:23.121	0	180	0.52	0.60	0.52	0.40	0.	0.	0.49	0.	0.	P
0839+0104	08:39:49.6109	+01:04:26.735	0	45	0.42	0.51	0.65	0.5	0.	0.	0.6	0.	0.	P
0840+1312	08:40:47.5890	+13:12:23.560	0	540	2.61	1.24	0.80	1.0	1.9	1.62	1.58	1.01	0.90	P
E0841+7053	08:41:24.3652	+70:53:42.173	0	90	3.82	2.60	1.60	2.20	1.7	2.82	3.17	3.56	2.91	P
0847-0703	08:47:56.7372	-07:03:16.902	0	45	0.18	0.44	0.25	0.	0.73	0.91	0.8	1.1	0.92	P
0849-3541	08:49:45.6235	-35:41:01.277	0	45	0.38	0.52	0.49	0.	0.56	0.65	0.85	0.80	0.46	P
E0854+2006	08:54:48.8749	+20:06:30.640	0	180	1.51	2.30	2.40	3.00	3.8	7.16	7.34	6.49	6.26	P
0858-1950	08:58:05.3632	-19:50:36.935	0	360	1.23	0.70	0.68	0.	0.72	0.69	0.	0.	0.63	P
0900-2808	09:00:40.0390	-28:08:20.350	0	180	1.47	2.06	1.40	0.	0.82	0.	0.55	0.	0.	P
0902-1415	09:02:16.8309	-14:15:30.875	0	180	2.90	2.10	1.68	1.60	1.04	1.21	1.8	0.	0.	P
0903+4651	09:03:03.9901	+46:51:04.137	0	180	1.76	1.70	0.96	1.30	0.	0.94	0.5	0.	0.	P
0906-2019	09:06:51.3053	-20:19:54.804	0	180	0.61	0.70	0.69	0.	0.58	0.	0.7	0.	0.	P
E0909+0121	09:09:10.0915	+01:21:35.617	0	45	0.76	1.30	0.88	1.40	2.1	0.79	1.7	1.14	1.14	P
0909+4253	09:09:33.4970	+42:53:46.480	0	90	4.23	1.61	0.85	0.	1.0	0.85	1.1	0.	0.57	P
0914+0245	09:14:37.9134	+02:45:59.245	0	45	0.44	0.89	1.02	0.	1.4	0.94	1.1	0.	1.7	P
0920+4441	09:20:58.4584	+44:41:53.985	0	360	1.02	1.00	1.18	1.50	1.3	2.29	2.15	1.81	1.39	P
0921-2618	09:21:29.3538	-26:18:43.386	0	45	1.29	3.19	2.98	1.90	2.02	1.03	1.12	0.86	0.83	P
0921+6215	09:21:36.2310	+62:15:52.180	0	45	0.95	1.20	1.65	1.20	0.9	1.22	1.0	0.81	0.60	P
0922-3959	09:22:46.4182	-39:59:35.067	0	45	2.62	1.73	1.71	1.60	1.31	1.12	0.9	0.7	0.48	P
E0927+3902	09:27:03.0139	+39:02:20.851	0	720	2.89	7.60	7.20	6.60	6.7	8.56	6.60	5.61	4.70	P
0929+5013	09:29:15.4402	+50:13:35.990	0	180	0.52	0.41	0.41	0.	0.45	0.	0.42	0.	0.50	P
0937+5008	09:37:12.3273	+50:08:52.097	0	45	0.17	0.18	0.25	0.	0.48	0.	0.54	0.	0.86	P
0940+2603	09:40:14.7219	+26:03:29.944	0	45	0.46	0.29	0.43	0.	0.	0.	0.48	0.	0.	P
0948+4039	09:48:55.3381	+40:39:44.587	0	45	1.60	1.00	1.10	0.80	1.3	1.49	1.91	1.18	0.95	P
E0949+6614	09:49:12.2100	+66:14:59.321	0	720	2.30	1.25	0.	0.	0.	0.	0.	0.	0.	X
E0951+699	09:55:52.725	+69:40:45.78	—	—	8.37	3.91	2.6	1.73	1.4	1.3	1.3	0.8	0.8	X
0954+1743	09:54:56.8236	+17:43:31.222	0	360	1.16	0.70	0.61	0.60	0.	0.	0.4	0.	0.	P

Table 1. continued.

IAU NAME	RA (J2000)	DEC	MIN	MAX	S20	S6	S3.5	S2	S1.3	S0.9	S0.7	S0.5	S0.3	Code
HHMM+DDMM	HH MM SS.SSSS	DDD MM SS.SSS	(arcsec)	(arcsec)	Jy	Jy	Jy	Jy	Jy	Jy	Jy	Jy	Jy	
0956+2515	09:56:49.8753	+25:15:16.049	0	180	1.08	1.50	2.08	0.90	0.	0.86	0.7	0.86	0.53	P
0957+5522	09:57:38.1849	+55:22:57.769	0	540	3.08	1.9	1.50	0.80	0.9	0.98	0.9	0.7	0.68	P
0958+4725	09:58:19.6716	+47:25:07.842	0	45	0.60	0.70	0.84	0.70	1.6	0.90	1.1	0.7	0.	P
0958+3224	09:58:20.9496	+32:24:02.209	0	15	1.25	1.10	0.60	1.10	0.90	0.	0.	0.	0.	P
0958+6533	09:58:47.2451	+65:33:54.818	0	45	0.73	0.48	0.55	0.60	0.9	1.04	0.97	0.8	0.91	P
1018+3542	10:18:10.9880	+35:42:39.441	0	45	0.62	0.90	0.64	0.70	0.9	0.9	0.	0.	0.	P
1018+0530	10:18:27.8482	+05:30:29.961	0	45	0.28	0.63	0.29	0.	0.	0.	0.43	0.	0.	P
1018-3123	10:18:28.7520	-31:23:53.878	0	30	0.38	0.70	0.67	0.	0.56	1.05	1.49	0.	0.	P
1024+1912	10:24:44.8095	+19:12:20.415	0	90	0.68	0.76	0.63	0.	0.	0.	0.45	0.	0.	P
1025+1253	10:25:56.2853	+12:53:49.022	0	180	0.54	0.63	0.90	0.7	0.	0.69	0.6	0.	0.84	P
1033+4116	10:33:03.7078	+41:16:06.232	0	45	0.47	0.60	0.84	0.50	0.9	1.99	1.77	1.54	1.32	P
1033+6051	10:33:51.4289	+60:51:07.334	0	45	0.46	0.60	0.47	0.50	0.	0.	0.	0.75	0.85	P
1035-2011	10:35:02.1552	-20:11:34.359	0	90	0.92	1.81	1.86	0.90	1.19	0.66	0.7	0.	0.59	P
1037-2934	10:37:16.0797	-29:34:02.813	0	180	1.11	2.01	2.51	1.30	2.68	1.15	1.39	1.06	1.22	P
1038+0512	10:38:46.7803	+05:12:29.096	0	45	0.64	0.37	0.49	0.	1.4	1.5	1.1	1.0	0.	P
1041+0610	10:41:17.1625	+06:10:16.923	0	360	1.41	1.33	1.40	0.	1.2	0.95	1.3	1.0	0.66	P
1043+2408	10:43:09.0357	+24:08:35.409	0	45	0.32	0.33	0.65	0.8	0.8	0.83	1.0	0.	0.50	P
1044+8054	10:44:23.0625	+80:54:39.443	0	90	0.83	0.80	1.03	0.50	0.	0.	0.59	0.	0.60	P
1045+1735	10:45:14.3605	+17:35:48.088	0	45	0.47	0.39	0.32	0.	0.	0.	0.53	0.	0.	P
1048-1909	10:48:06.6206	-19:09:35.726	0	180	1.16	1.36	1.52	1.30	1.24	0.82	1.1	0.9	0.66	P
1048+7143	10:48:27.6199	+71:43:35.938	0	45	0.74	1.00	1.95	1.30	1.4	0.64	1.1	0.9	0.47	P
1051+2119	10:51:48.7890	+21:19:52.314	0	360	1.25	0.90	1.03	0.80	0.	0.	0.7	0.	0.	P
1056+7011	10:56:53.6174	+70:11:45.915	0	45	0.31	0.70	0.90	0.80	0.	0.90	1.25	1.11	1.13	P
1058+8114	10:58:11.5353	+81:14:32.675	0	45	0.24	0.69	0.57	0.80	0.9	0.96	0.50	0.77	0.70	P
E1058+0133	10:58:29.6052	+01:33:58.823	0	720	3.22	3.20	3.75	4.0	4.6	4.4	4.50	4.27	3.69	P
1101+3904	11:01:30.0704	+39:04:32.621	0	45	0.33	0.27	0.26	0.	0.	0.	0.45	0.	0.	P
1101+7225	11:01:48.8053	+72:25:37.118	0	45	1.25	0.86	0.61	0.	0.	1.51	1.62	0.92	0.65	P
1116+0829	11:16:09.9728	+08:29:22.023	0	45	0.24	0.28	0.33	0.	0.	0.	0.40	0.	0.	P
1118-1232	11:18:17.1413	-12:32:54.262	0	45	0.78	0.67	0.72	0.	1.18	1.08	0.7	0.	0.68	P
1118+1234	11:18:57.3014	+12:34:41.718	0	180	1.11	1.30	1.50	1.10	0.9	0.72	0.9	0.6	0.50	P
1125+2610	11:25:53.7119	+26:10:19.978	0	180	0.92	1.00	1.42	0.7	0.	0.	0.40	0.	0.	P
1127-1857	11:27:04.3924	-18:57:17.441	0	90	0.54	1.32	1.67	2.00	1.41	1.41	1.69	0.96	0.81	P
E1130-1449	11:30:07.0525	-14:49:27.388	0	720	5.62	4.60	3.06	2.30	1.87	3.56	2.60	2.96	2.56	P
1130+3031	11:30:42.4282	+30:31:35.365	0	45	0.37	0.41	0.21	0.	0.	0.	0.42	0.	0.	P
1130+3815	11:30:53.2826	+38:15:18.547	0	45	0.70	1.10	0.72	1.30	1.2	0.86	1.02	0.94	0.82	P
1131-0500	11:31:30.5167	-05:00:19.657	30	15	0.56	0.90	0.60	0.70	0.77	0.	0.46	0.	0.80	P
1146+3958	11:46:58.2979	+39:58:34.304	0	45	0.33	1.30	1.20	1.60	0.9	1.14	0.8	0.91	0.82	P
1147-3812	11:47:01.3707	-38:12:11.023	0	30	1.80	1.06	1.11	3.50	1.38	1.29	1.8	1.35	1.28	P
1150+2417	11:50:19.2121	+24:17:53.835	0	180	0.80	0.80	0.78	0.70	0.	0.84	0.6	0.	0.	P
1150-0023	11:50:43.8707	-00:23:54.204	0	360	2.77	1.92	1.25	1.40	0.86	0.7	0.65	0.	0.	P
1152-0841	11:52:17.2095	-08:41:03.313	0	180	0.70	0.74	1.01	0.	0.67	1.41	0.	1.25	1.13	P
1153+8058	11:53:12.4991	+80:58:29.154	0	90	1.34	1.20	1.45	1.3	0.	0.50	0.9	0.9	0.44	P
E1153+4931	11:53:24.4666	+49:31:08.830	0	45	1.57	0.5	1.12	1.22	2.1	1.80	1.73	1.60	1.53	P

Table 1. continued.

IAU NAME HHMM+DDMM	RA (J2000) HH MM SS.SSSS	DEC DDD MM SS.SSS	MIN (arcsec)	MAX (arcsec)	S20 Jy	S6 Jy	S3.5 Jy	S2 Jy	S1.3 Jy	S0.9 Jy	S0.7 Jy	S0.5 Jy	S0.3 Jy	Code
1154-3505	11:54:21.7949	-35:05:28.992	0	360	6.20	3.06	1.91	0.90	0.89	0.99	0.	0.	0.	P
1157+1638	11:57:34.8362	+16:38:59.650	0	45	0.81	0.87	0.56	0.5	0.8	1.1	0.4	0.	0.	P
E1159+2914	11:59:31.8339	+29:14:43.826	0	720	2.03	1.60	1.54	1.30	2.0	1.47	1.88	0.95	1.12	P
1203+4803	12:03:29.8546	+48:03:13.629	0	45	0.06	0.16	0.63	0.60	0.8	0.7	0.7	0.	0.	P
1209-2406	12:09:02.4451	-24:06:20.759	0	90	0.56	1.12	1.34	1.00	1.15	1.0	0.6	0.	0.	P
1209-3214	12:09:40.0563	-32:14:52.837	0	45	0.23	0.48	0.45	0.	0.32	0.	0.40	0.	0.	P
1215+1654	12:15:03.9791	+16:54:37.957	0	45	0.30	0.32	0.42	0.6	0.	0.	0.7	0.	0.	P
1215-1731	12:15:46.7517	-17:31:45.402	0	180	1.66	1.76	1.94	4.40	1.59	1.41	0.9	0.7	1.06	P
1219+4829	12:19:06.4147	+48:29:56.164	0	180	0.62	0.80	0.82	0.52	0.7	0.76	0.6	0.	0.52	P
1221+2813	12:21:31.6905	+28:13:58.500	0	90	0.73	0.90	0.88	0.7	0.	0.	0.	0.	0.	P
1222+0413	12:22:22.5496	+04:13:15.776	0	180	0.80	0.7	0.71	0.6	0.7	1.21	1.6	0.	0.94	P
1223+8040	12:23:40.4936	+80:40:04.340	0	180	0.71	0.51	0.45	0.	0.	0.	0.58	0.	0.	P
1224+0330	12:24:52.4219	+03:30:50.292	0	180	1.28	1.00	1.04	1.10	0.	0.	0.8	0.	0.	P
1224+2122	12:24:54.4583	+21:22:46.388	0	15	2.09	1.3	1.2	1.3	0.9	1.17	0.7	1.58	1.42	P
EM1229+0203	12:29:06.6997	+02:03:08.598	0	15	32.0	30.00	27.50	34.00	20.0	24.30	24.36	25.13	23.63	P(3C273)
1230+1223	12:30:49.4233	+12:23:28.043	0	15	99.	59.03	3.0	0.	19.7	17.64	12.53	8.95	7.55	P
1233+8054	12:33:12.8980	+80:54:33.963	0	45	0.26	0.	0.19	0.	0.	0.	0.45	0.	0.	P
1239+0730	12:39:24.5883	+07:30:17.189	0	180	0.57	0.70	0.64	0.70	0.	0.85	0.7	0.	0.	P
1239+0443	12:39:32.7554	+04:43:05.215	0	45	0.35	0.32	0.30	0.	0.	0.93	0.	0.	0.88	P
1239-1023	12:39:43.0614	-10:23:28.692	0	360	1.52	0.90	1.14	0.90	0.77	0.	0.52	0.	0.	P
1246-0730	12:46:04.2321	-07:30:46.574	0	180	0.55	1.10	0.63	1.60	1.13	0.90	0.	0.	0.76	P
E1246-2547	12:46:46.8020	-25:47:49.288	0	540	1.17	1.24	1.47	2.20	2.51	0.96	1.4	1.23	1.44	P
1254+1141	12:54:38.2556	+11:41:05.895	0	45	0.79	0.8	0.9	0.9	0.9	0.9	0.7	0.	0.	P
E1256-0547	12:56:11.1665	-05:47:21.524	0	180	9.71	11.20	15.60	21.80	20.02	14.64	14.72	13.12	12.98	P
1257+3229	12:57:57.2317	+32:29:29.318	0	45	0.65	0.49	0.46	0.	0.7	0.6	0.8	0.	0.	P
1257-3155	12:57:59.0608	-31:55:16.851	0	360	1.14	2.03	1.84	0.70	1.46	1.1	1.0	0.	0.78	P
1258-2219	12:58:54.4787	-22:19:31.125	0	180	0.79	1.07	1.15	0.60	0.87	0.90	0.74	0.	0.	P
1259+5140	12:59:31.1751	+51:40:56.248	0	45	0.27	0.31	0.18	0.	0.6	0.73	0.7	0.7	0.	P
1302+5748	13:02:52.4652	+57:48:37.609	0	45	0.32	0.52	0.89	0.4	0.8	0.7	0.4	0.	0.	P
1305-1033	13:05:33.0150	-10:33:19.428	0	180	0.71	0.80	0.60	1.20	0.41	0.	0.60	0.	0.	P
1309+1154	13:09:33.9324	+11:54:24.552	0	90	0.86	0.8	0.73	0.6	0.56	0.	0.6	0.	0.	P
E1310+3220	13:10:28.6638	+32:20:43.782	0	45	1.69	3.5	4.13	2.3	2.5	3.58	2.96	2.27	1.56	P
1310+3233	13:10:59.4027	+32:33:34.449	0	45	0.37	0.87	0.61	0.5	0.	0.	0.4	0.	0.	P
1316-3338	13:16:07.9859	-33:38:59.172	0	180	1.28	1.16	1.27	1.20	1.50	1.39	1.7	1.9	1.00	P
1326+3154	13:26:16.5122	+31:54:09.515	0	360	4.86	2.40	1.60	1.00	0.	0.	0.5	0.	0.	P
1327+2210	13:27:00.8613	+22:10:50.163	0	180	0.85	1.5	1.77	1.6	0.9	1.23	0.8	0.8	0.89	P
1329+3154	13:29:52.8649	+31:54:11.055	0	90	0.83	0.52	0.83	1.4	0.8	0.75	0.9	0.	0.73	P
1330+2509	13:30:37.6906	+25:09:10.877	0	180	7.05	3.29	2.23	0.	1.1	0.95	0.6	0.8	0.7	P
EM1331+3030	13:31:08.2879	+30:30:32.958	0	720	14.90	7.47	5.23	3.40	2.2	1.87	1.5	1.1	0.77	P(3C286)
1332-0509	13:32:04.4646	-05:09:43.305	0	180	0.53	0.47	0.64	0.	0.68	1.30	1.66	0.	1.00	P
1333+2725	13:33:07.4920	+27:25:18.414	0	45	0.22	0.32	0.40	0.	0.8	0.76	0.6	0.	0.9	P
E1337-1257	13:37:39.7827	-12:57:24.693	0	540	2.68	4.30	4.30	3.00	6.06	4.32	4.48	3.79	3.40	P
1344+6606	13:44:08.6796	+66:06:11.643	0	45	0.65	0.55	0.51	0.8	0.	0.	0.4	0.	0.	P

Table 1. continued.

IAU NAME	RA (J2000)	DEC	MIN	MAX	S20	S6	S3.5	S2	S1.3	S0.9	S0.7	S0.5	S0.3	Code
HHMM+DDMM	HH MM SS.SSSS	DDD MM SS.SSS	(arcsec)	(arcsec)	Jy	Jy	Jy	Jy	Jy	Jy	Jy	Jy	Jy	
E1347+1217	13:47:33.3616	+12:17:24.238	0	540	5.40	2.90	2.30	1.60	1.0	1.31	0.	0.	0.57	P
1349+5341	13:49:34.6566	+53:41:17.040	0	360	1.10	0.90	0.67	0.70	0.	0.	0.5	0.	0.47	P
1354-0206	13:54:06.8953	-02:06:03.190	0	90	0.73	0.90	0.78	0.6	0.58	0.	0.4	0.	0.	P
1357-1744	13:57:06.0742	-17:44:01.904	0	90	1.49	1.13	0.76	0.4	0.40	0.	0.6	0.	0.	P
1357-1527	13:57:11.2449	-15:27:28.786	0	90	0.68	0.99	0.83	0.6	0.55	0.9	0.7	0.	0.	P
1357+7643	13:57:55.3715	+76:43:21.051	0	90	0.65	0.60	0.98	0.40	0.7	0.8	0.9	0.6	0.54	P
1359+0159	13:59:27.1478	+01:59:54.543	0	180	0.81	0.86	0.49	0.	0.	0.	0.7	0.	0.	P
1408-0752	14:08:56.4812	-07:52:26.666	0	90	0.69	0.78	0.63	0.60	0.86	0.83	0.9	0.	0.60	P
1409-2657	14:09:50.1697	-26:57:36.979	0	45	0.27	1.52	1.38	0.	0.75	0.	0.54	0.	0.	P
EM1411+5212	14:11:20.63	+52:12:09.0	15	540	22.72	6.76	0.	0.	0.	0.86	0.	0.	0.	X (3C295)
1415+1320	14:15:58.8174	+13:20:23.712	0	90	1.09	1.20	1.62	2.00	0.9	1.16	0.6	1.14	0.79	P
1418-3509	14:18:58.9169	-35:09:42.506	0	45	0.41	0.61	0.60	0.	0.63	0.	0.	0.	0.71	P
1419+5423	14:19:46.5974	+54:23:14.787	0	180	0.79	1.10	1.28	1.20	0.8	0.87	0.96	1.07	1.08	P
1419+3821	14:19:46.6137	+38:21:48.475	0	30	0.61	0.50	0.51	0.6	1.1	0.83	0.7	1.0	0.	P
1425+1424	14:25:49.0180	+14:24:56.902	0	45	0.48	0.85	0.56	0.7	0.	0.	0.	0.	0.	P
1427-3305	14:27:41.3610	-33:05:31.513	0	45	0.16	0.35	0.53	0.	0.80	1.14	1.84	1.35	1.61	P
1432-1801	14:32:57.6906	-18:01:35.248	0	180	1.01	0.86	0.65	0.	0.35	0.	0.	0.	0.72	P
1436+6336	14:36:45.8021	+63:36:37.866	0	45	0.95	0.80	0.71	0.50	0.5	0.81	0.78	0.	0.57	P
1438-2204	14:38:09.4694	-22:04:54.748	0	45	0.77	0.68	0.88	0.80	1.06	1.24	0.63	0.	0.67	P
1446+1721	14:46:35.3462	+17:21:07.581	0	180	0.75	0.80	0.86	1.00	0.	0.	0.7	0.	0.	P
1457-3539	14:57:26.7117	-35:39:09.970	0	180	0.67	0.93	0.88	0.	0.90	1.18	1.59	0.	0.76	P
E1459+7140	14:59:07.5838	+71:40:19.867	0	720	7.47	2.80	2.00	1.9	1.3	0.64	0.7	0.48	0.34	P
E1504+1029	15:04:24.9797	+10:29:39.198	0	360	1.77	1.50	1.93	1.4	1.6	1.17	1.3	0.9	0.82	P
1505+0326	15:05:06.4771	+03:26:30.812	0	45	0.39	0.90	0.97	0.80	0.	0.	0.57	0.	0.	P
1506+3730	15:06:09.5299	+37:30:51.132	0	45	0.94	0.70	0.78	0.	0.	0.	0.41	0.	0.57	P
1507-1652	15:07:04.7869	-16:52:30.267	0	360	2.71	2.11	1.71	2.40	1.05	1.3	1.1	0.	0.	P
1510-0543	15:10:53.5914	-05:43:07.417	0	180	3.57	2.33	1.56	0.	1.27	1.12	1.0	0.7	0.77	P
1511+0518	15:11:41.2652	+05:18:09.264	0	45	0.06	0.47	0.49	0.7	0.	0.	0.5	0.	0.	P
E1512-0905	15:12:50.5329	-09:05:59.829	0	540	2.70	3.30	2.15	2.50	2.93	2.78	2.12	2.48	2.30	P
1513-1012	15:13:44.8934	-10:12:00.264	0	15	0.87	1.00	0.95	1.30	1.38	1.0	0.9	0.	0.64	P
1516+0015	15:16:40.2190	+00:15:01.908	0	15	0.92	1.59	1.01	1.2	1.6	1.71	2.29	1.34	1.12	P
1516+1932	15:16:56.7961	+19:32:12.991	0	45	0.46	0.5	0.61	0.5	0.54	0.91	0.6	0.	0.63	P
1517-2422	15:17:41.8131	-24:22:19.475	0	45	2.04	3.17	3.65	2.00	3.45	2.02	1.83	1.67	1.76	P
1521+4336	15:21:49.6138	+43:36:39.267	0	45	0.23	0.22	0.57	0.7	0.	0.	1.3	0.	0.	P
1522-2730	15:22:37.6759	-27:30:10.785	0	360	1.11	1.38	1.57	1.60	1.03	0.	0.77	0.	0.	P
1534+0131	15:34:52.4536	+01:31:04.206	0	45	1.34	0.80	0.90	0.70	0.	0.69	1.0	0.7	0.55	P
1540+1447	15:40:49.4915	+14:47:45.884	0	360	1.39	1.60	1.00	1.10	1.0	0.63	0.9	0.8	0.	P
1549+5038	15:49:17.4685	+50:38:05.788	0	180	0.63	0.70	1.17	0.8	0.9	0.68	0.9	0.7	0.41	P
1549+0237	15:49:29.4368	+02:37:01.163	0	90	0.84	2.20	1.08	1.60	2.7	1.78	2.22	1.50	1.29	P
1550+0527	15:50:35.2692	+05:27:10.448	0	360	2.30	1.60	1.75	2.00	2.5	2.72	2.33	1.50	1.48	P
1551+5806	15:51:58.2078	+58:06:44.453	0	45	0.19	0.27	0.31	0.3	0.	0.	0.4	0.	0.	P
1553+1256	15:53:32.6978	+12:56:51.716	0	180	0.95	0.70	0.42	0.50	0.	0.	0.	0.	0.60	P
1557-0001	15:57:51.4339	-00:01:50.413	0	360	1.11	0.90	1.06	0.93	0.43	0.	0.70	0.	0.	P

Table 1. continued.

IAU NAME	RA (J2000)	DEC	MIN	MAX	S20	S6	S3.5	S2	S1.3	S0.9	S0.7	S0.5	S0.3	Code
HHMM+DDMM	HH MM SS.SSSS	DDD MM SS.SSS	(arcsec)	(arcsec)	Jy	Jy	Jy	Jy	Jy	Jy	Jy	Jy	Jy	
1602+3326	16:02:07.2634	+33:26:53.072	0	540	2.99	2.00	2.05	1.40	0.9	1.00	0.6	0.	0.53	P
1603+1554	16:03:38.0633	+15:54:02.370	0	45	0.10	0.25	0.26	0.	0.	0.	0.50	0.	0.	P
1604+5714	16:04:37.3552	+57:14:36.675	0	45	0.50	0.33	0.49	0.	0.7	0.91	1.02	0.	0.46	P
1607+1551	16:07:06.4303	+15:51:34.485	0	180	0.63	0.51	0.	0.	0.	0.76	0.	0.	0.86	P
1608+1029	16:08:46.2031	+10:29:07.775	0	45	1.39	1.70	1.20	2.10	2.0	1.08	1.5	1.31	0.87	P
E1609+2641	16:09:13.3207	+26:41:29.036	0	720	4.91	1.70	0.85	0.50	0.	0.	0.	0.	0.	X
1610-3958	16:10:21.8790	-39:58:58.327	0	180	0.59	0.34	0.33	0.	0.35	1.11	0.	1.19	1.08	P
M1613+3412	16:13:41.0642	+34:12:47.909	0	90	4.02	2.30	2.67	2.00	4.1	1.89	1.55	1.02	0.77	P (1611+343)
1617+0246	16:17:49.9081	+02:46:43.105	0	45	0.63	0.70	0.68	0.7	0.	0.	0.5	0.	0.	P
1619+2247	16:19:14.8246	+22:47:47.851	0	45	0.48	0.35	0.64	0.8	0.	0.	0.7	0.	0.	P
1625-2527	16:25:46.8916	-25:27:38.326	0	720	2.52	1.5	1.10	0.5	2.06	0.	0.	1.70	1.65	P
1625+4134	16:25:57.6697	+41:34:40.629	0	45	1.68	1.10	1.03	0.90	0.9	0.8	0.4	0.6	0.	P
1626-2951	16:26:06.0208	-29:51:26.971	0	360	2.29	2.50	2.25	2.2	1.78	1.68	1.61	1.57	1.41	P
1631+4927	16:31:16.5398	+49:27:39.515	0	45	0.31	0.28	0.63	0.4	0.	0.	0.4	0.	0.	P
1635+3808	16:35:15.4929	+38:08:04.500	0	360	2.73	2.20	2.35	3.30	3.9	3.96	4.57	3.86	3.51	P
E1638+5720	16:38:13.4562	+57:20:23.979	0	360	1.20	1.60	1.55	1.70	1.3	1.55	1.26	1.03	0.97	P
1640+3946	16:40:29.6327	+39:46:46.028	0	45	0.98	0.80	1.75	1.50	0.	0.	1.0	0.	0.	P
1642-0621	16:42:02.1770	-06:21:23.700	0	180	1.22	1.20	1.23	0.	0.	0.	0.	0.	0.58	P
1642+6856	16:42:07.8485	+68:56:39.756	0	180	1.72	1.60	1.20	1.20	1.4	2.33	1.50	1.37	1.08	P
1642+3948	16:42:58.8099	+39:48:36.993	0	720	7.10	7.80	7.00	13.00	6.5	8.75	7.19	6.56	5.63	P
1645+6330	16:45:58.5526	+63:30:10.922	0	45	0.22	0.18	0.21	0.	0.	0.76	0.	0.57	0.67	P
1648+4104	16:48:29.2580	+41:04:05.554	0	45	0.24	0.20	0.21	0.	0.	0.	0.43	0.	0.	P
1650-2943	16:50:39.5441	-29:43:46.953	0	15	0.57	1.0	1.17	1.0	1.01	0.	0.54	0.	0.	P
1653+3945	16:53:52.2166	+39:45:36.608	0	90	1.56	1.20	1.10	1.20	1.2	1.20	0.7	0.	0.49	P
1657+5705	16:57:20.7089	+57:05:53.503	0	180	0.94	0.40	0.50	0.4	0.5	0.6	0.	0.	0.	P
1657+4808	16:57:46.8789	+48:08:33.041	0	360	1.04	0.74	0.73	0.	0.	0.	0.51	0.	0.	P
1658+4737	16:58:02.7796	+47:37:49.231	0	90	0.86	1.20	1.15	1.3	0.	1.13	1.3	0.	0.	P
E1658+0741	16:58:09.0114	+07:41:27.540	0	45	1.41	1.50	1.05	1.30	1.4	2.18	1.3	1.18	1.12	P
1658+0515	16:58:33.4473	+05:15:16.444	0	360	1.53	1.70	0.92	0.6	0.8	0.6	0.4	0.	0.	P
1700+6830	17:00:09.2929	+68:30:06.962	0	45	0.34	0.26	0.38	0.2	0.2	0.49	0.79	0.98	1.09	P
1700-2610	17:00:53.1540	-26:10:51.725	0	180	0.61	0.70	2.77	0.80	0.51	1.04	0.	0.95	0.96	P
1707+0148	17:07:34.4152	+01:48:45.699	0	45	0.46	0.5	0.59	1.0	0.8	0.88	0.6	0.	0.58	P
1713-2658	17:13:31.2756	-26:58:52.523	0	360	1.13	1.02	1.41	0.	1.39	0.	0.80	0.	0.	P
1716+6836	17:16:13.9380	+68:36:38.744	0	30	0.49	0.60	0.88	0.80	0.6	0.54	0.59	0.67	0.60	P
1717-3342	17:17:36.0300	-33:42:08.764	0	90	0.62	0.58	0.61	0.	0.68	0.	1.18	4.02	3.03	P
1719+1745	17:19:13.0484	+17:45:06.436	0	45	0.54	0.60	0.79	0.9	0.70	0.57	0.6	0.	0.54	P
1724+4004	17:24:05.4288	+40:04:36.456	0	45	0.57	0.50	0.42	0.	0.	0.69	0.41	0.	0.	P
1727+4530	17:27:27.6508	+45:30:39.731	0	90	0.91	0.90	1.55	1.6	0.9	1.38	1.19	1.10	0.94	P
1728+0427	17:28:24.9527	+04:27:04.914	0	180	0.68	0.90	0.77	0.80	0.	0.77	1.1	1.12	0.95	P
E1733-1304	17:33:02.7057	-13:04:49.548	0	720	5.99	5.0	10.50	11.00	0.	4.00	3.51	3.18	2.75	P
1733-3722	17:33:15.1930	-37:22:32.395	0	180	0.65	0.95	1.18	0.	1.12	0.	0.77	1.87	1.67	P
1734+3857	17:34:20.5785	+38:57:51.443	0	180	0.80	1.20	1.50	1.22	1.2	1.21	1.31	1.10	1.08	P
1737+0621	17:37:13.7290	+06:21:03.572	0	180	0.89	0.70	0.50	0.5	0.	0.	0.8	0.7	0.	P

Table 1. continued.

IAU NAME	RA (J2000)	DEC	MIN	MAX	S20	S6	S3.5	S2	S1.3	S0.9	S0.7	S0.5	S0.3	Code
HHMM+DDMM	HH MM SS.SSSS	DDD MM SS.SSS	(arcsec)	(arcsec)	Jy	Jy	Jy	Jy	Jy	Jy	Jy	Jy	Jy	
1739+4955	17:39:27.3904	+49:55:03.368	0	180	0.53	0.62	0.5	0.60	0.	0.61	0.95	0.	0.45	P
1739+4737	17:39:57.1290	+47:37:58.361	0	45	0.76	0.90	0.94	0.90	0.8	0.79	0.7	0.7	0.46	P
1740+5211	17:40:36.9778	+52:11:43.407	0	180	0.81	0.90	1.60	0.80	1.2	1.24	1.1	1.14	0.93	P
E1743-0350	17:43:58.8561	-03:50:04.616	0	180	1.41	2.70	3.80	3.8	3.81	2.69	2.16	2.36	1.93	P
1744-3116	17:44:23.5826	-31:16:35.986	0	45	0.42	0.42	0.58	0.59	0.	0.	0.67	0.	0.	P
1745-0753	17:45:27.1040	-07:53:03.600	0	90	1.18	1.41	0.64	0.	0.	0.	0.45	0.	0.	P
1745+1720	17:45:35.2081	+17:20:01.423	0	540	1.06	1.10	0.96	0.7	0.	0.	0.5	0.	0.	P
1747+4658	17:47:26.6472	+46:58:50.926	0	45	0.30	0.46	0.87	0.6	0.	0.	0.4	0.	0.	P
1748+7005	17:48:32.8402	+70:05:50.768	0	90	0.74	2.10	0.42	0.50	0.6	0.57	0.6	0.80	0.73	P
E1751+0939	17:51:32.8185	+09:39:00.728	0	90	0.62	1.80	2.00	4.5	0.	5.27	4.60	4.61	4.20	P
1753+4409	17:53:22.6479	+44:09:45.686	0	180	0.77	0.90	0.75	0.80	0.7	0.6	0.7	0.6	0.	P
1753+2848	17:53:42.4736	+28:48:04.939	0	45	0.41	0.70	0.55	0.60	2.1	0.95	1.8	1.8	0.61	P
1800+3848	18:00:24.7653	+38:48:30.697	0	45	0.33	0.80	1.05	1.9	0.9	0.66	0.7	0.	0.	P
E1800+7828	18:00:45.6839	+78:28:04.018	0	540	2.22	2.10	2.85	3.00	1.8	2.37	2.06	2.02	1.89	P
1801+4404	18:01:32.3148	+44:04:21.900	0	180	0.73	0.60	0.45	1.00	1.2	1.43	1.09	0.74	0.72	P
1802-3940	18:02:42.6800	-39:40:07.905	30	45	2.27	1.20	1.24	0.	1.41	3.17	2.70	2.93	2.60	P
E1806+6949	18:06:50.6806	+69:49:28.108	0	15	1.88	1.40	1.55	1.60	1.4	1.08	0.89	0.98	0.93	P
1810+5649	18:10:03.3191	+56:49:22.968	0	180	0.71	0.59	0.44	0.	0.6	0.7	0.5	0.	0.	P
1813+0615	18:13:33.4119	+06:15:42.025	0	45	0.19	0.34	0.26	0.	0.	0.	0.43	0.	0.	P
1820-2528	18:20:57.8486	-25:28:12.584	0	30	1.35	0.73	0.93	0.	0.71	0.	0.53	0.	0.56	P
1823+6857	18:23:32.8571	+68:57:52.611	0	45	0.22	0.19	0.20	0.	0.	0.	0.46	0.	0.	P
1824+1044	18:24:02.8552	+10:44:23.774	0	90	0.97	1.30	0.75	0.50	0.	0.76	0.	0.	0.	P
1824+5651	18:24:07.0683	+56:51:01.490	0	540	1.41	1.30	1.05	1.20	1.5	1.39	1.20	1.12	1.29	P
E1829+4844	18:29:31.7832	+48:44:46.161	0	720	13.75	3.00	3.50	2.50	2.8	2.96	2.62	1.96	1.55	P
1830+0619	18:30:05.9398	+06:19:15.952	0	45	0.40	0.44	0.48	0.5	0.	0.95	0.5	0.	0.70	P
1832+1357	18:32:43.4711	+13:57:44.400	0	180	0.64	0.82	0.81	0.5	0.	0.	0.4	0.	0.	P
1842+6809	18:42:33.6416	+68:09:25.227	0	180	0.80	0.70	0.81	0.90	1.1	0.89	0.93	0.82	0.54	P
1848+3219	18:48:22.0885	+32:19:02.603	0	45	0.52	0.76	0.61	0.8	0.	0.	0.7	0.6	0.50	P
1848+3244	18:48:34.3611	+32:44:00.139	0	45	1.01	0.52	0.55	0.5	0.	0.	0.	0.	0.	P
1849+6705	18:49:16.0723	+67:05:41.679	0	180	0.52	0.67	0.60	1.00	1.2	2.53	2.26	2.29	1.91	P
1850+2825	18:50:27.5898	+28:25:13.155	0	45	0.23	1.00	1.15	0.70	1.5	1.10	0.6	0.	0.	P
1851+0035	18:51:46.7217	+00:35:32.414	0	45	0.86	0.6	1.1	1.1	1.1	0.	0.70	0.	0.	P
1856+0610	18:56:31.8386	+06:10:16.754	0	45	0.16	0.3	0.3	0.	0.	0.	0.40	0.	0.	P
E1902+3159	19:02:55.9388	+31:59:41.702	0	180	3.20	1.40	1.83	1.1	1.3	1.02	0.5	0.	0.	P
1911-2006	19:11:09.6528	-20:06:55.109	0	360	2.71	3.23	3.40	1.80	2.67	2.90	2.66	3.03	2.61	P
1923-2104	19:23:32.1898	-21:04:33.333	0	720	3.17	3.29	3.91	0.	2.55	2.41	2.46	2.39	2.43	P
1924+1540	19:24:39.4558	+15:40:43.941	0	45	0.36	0.45	0.44	0.40	0.	0.	0.65	0.	0.	P
1924-2914	19:24:51.0559	-29:14:30.121	0	720	13.39	6.30	5.80	17.00	13.84	16.32	14.35	12.49	11.08	P
E1925+2106	19:25:59.6053	+21:06:26.162	0	540	1.20	1.5	1.00	1.8	0.90	0.	1.0	0.	0.	P
1927+6117	19:27:30.4426	+61:17:32.879	0	45	0.53	0.70	0.50	0.60	1.0	0.52	1.0	0.58	0.45	P
E1927+7358	19:27:48.4951	+73:58:01.569	0	180	3.95	3.00	3.70	2.00	3.5	5.01	4.94	3.82	3.28	P
1930+1532	19:30:52.7324	+15:32:34.002	0	180	0.64	0.59	0.60	0.	0.	0.	0.40	0.	0.	P
1937-3958	19:37:16.2173	-39:58:01.553	0	180	1.00	1.64	2.41	0.40	1.76	0.64	1.5	1.2	0.65	P

Table 1. continued.

IAU NAME HHMM+DDMM	RA (J2000) HH MM SS.SSSS	DEC DDD MM SS.SSS	MIN (arcsec)	MAX (arcsec)	S20 Jy	S6 Jy	S3.5 Jy	S2 Jy	S1.3 Jy	S0.9 Jy	S0.7 Jy	S0.5 Jy	S0.3 Jy	Code
1939-1525	19:39:26.6577	-15:25:43.058	0	90	0.61	0.62	0.89	1.00	1.19	1.0	0.7	0.6	0.	P
1955+1358	19:55:11.5714	+13:58:16.240	0	45	0.16	0.26	0.31	0.4	0.	1.00	0.	0.99	1.01	P
1955+5131	19:55:42.7382	+51:31:48.546	0	45	1.59	1.10	1.50	1.20	0.8	0.94	0.95	0.67	0.58	P
1956-3225	19:56:59.4858	-32:25:46.277	0	45	0.47	0.93	0.88	0.50	0.71	0.	0.58	0.	0.51	P
1957-3845	19:57:59.8192	-38:45:06.356	0	90	1.49	4.07	4.26	1.50	3.76	1.82	2.05	1.24	1.20	P
2000-1748	20:00:57.0904	-17:48:57.672	0	180	0.55	2.35	2.33	0.90	2.46	1.57	1.74	1.27	1.16	P
2002+4725	20:02:10.4182	+47:25:28.773	0	90	0.52	0.95	0.84	0.9	0.	0.	0.5	0.	0.37	P
2005-1822	20:05:17.2931	-18:22:03.322	0	180	0.74	0.40	0.42	0.	0.60	1.18	0.	0.98	0.62	P
2005+7752	20:05:30.9985	+77:52:43.247	0	180	1.06	1.60	2.50	1.60	0.8	0.96	0.99	1.33	1.54	P
2006+6424	20:06:17.6946	+64:24:45.417	0	180	0.52	0.60	0.97	0.9	0.	1.13	0.8	0.78	0.49	P
2007+6607	20:07:28.7710	+66:07:22.535	0	45	0.51	0.51	0.49	0.	0.7	0.5	0.59	0.	0.	P
E2007+4029	20:07:44.9448	+40:29:48.604	0	45	2.47	4.50	2.85	2.3	0.	0.	1.10	2.41	1.89	P
2009+7229	20:09:52.3038	+72:29:19.351	0	180	0.95	0.90	0.70	0.7	0.7	0.68	0.90	1.24	0.86	P
2011-0644	20:11:14.2158	-06:44:03.555	0	360	2.60	1.3	0.85	0.49	0.37	0.	0.	0.	0.	P
2011-1546	20:11:15.7109	-15:46:40.253	0	180	0.55	1.55	2.31	1.10	2.49	1.08	1.6	1.2	0.59	P
2012+4628	20:12:05.6374	+46:28:55.776	0	90	0.62	0.38	0.59	2.0	0.	0.	1.5	0.	0.82	P
E 3C409	20:14:27.596	+23:34:52.91	—	—	13.9	3.12	—	—	—	—	—	—	—	X
2015+3710	20:15:28.7333	+37:10:59.505	0	45	2.17	2.76	2.95	2.59	0.	0.	2.90	3.57	2.98	P
2015+3410	20:15:28.8318	+34:10:39.409	0	30	0.85	0.60	0.77	0.40	0.	0.	0.50	0.	0.	P
2015+6554	20:15:55.3687	+65:54:52.659	0	45	0.67	0.50	0.55	0.	0.	0.	0.42	0.	0.	P
2016+1632	20:16:13.8600	+16:32:34.112	0	45	0.36	0.33	0.61	0.6	0.	0.	0.6	0.	0.	P
E2020+2942	20:20:06.5636	+29:42:14.150	0	720	8.61	4.06	0.	0.	0.	0.	0.	0.	0.	X
E2022+6136	20:22:06.6816	+61:36:58.804	0	540	2.09	2.30	2.60	2.00	1.6	1.46	1.24	0.75	0.61	P
2023+3153	20:23:19.0173	+31:53:02.305	0	360	3.37	2.80	2.10	1.70	0.	0.	1.60	0.	0.	P
2023+5427	20:23:55.8440	+54:27:35.828	0	30	1.07	1.05	1.00	1.10	0.7	0.74	0.6	0.7	0.61	P
2024-3253	20:24:35.5764	-32:53:35.912	0	180	0.89	0.78	0.43	0.	0.51	0.74	0.	0.	0.77	P
2025+3343	20:25:10.8420	+33:43:00.214	0	180	1.27	2.8	3.80	2.5	2.30	0.	4.19	3.45	3.35	P
2025-0735	20:25:40.6604	-07:35:52.688	0	45	1.35	0.89	0.72	0.	1.25	0.91	0.	1.18	1.06	P
2031+1219	20:31:54.9942	+12:19:41.340	0	180	1.00	0.70	0.75	0.80	0.	1.53	1.24	1.19	1.06	P
2035+1056	20:35:22.3333	+10:56:06.789	0	540	1.07	0.60	0.40	0.40	0.6	0.71	0.	0.	0.68	P
MDR21	20:37:14.0	+42:29:46	—	—	—	—	21.53	20.16	19.11	18.21	17.59	16.77	15.52	X
E2038+5119	20:38:37.0347	+51:19:12.662	0	90	6.08	3.70	4.20	3.3	0.	0.	2.38	1.32	1.26	P
2040-2507	20:40:08.7729	-25:07:46.663	0	45	0.61	0.60	0.57	0.40	0.29	0.	0.43	0.	0.	P
2049+1003	20:49:45.8649	+10:03:14.398	0	45	0.29	0.60	0.40	0.9	0.	0.	0.8	0.	0.58	P
2051+1743	20:51:35.5829	+17:43:36.900	0	45	0.45	0.63	0.42	0.4	0.	0.	0.4	0.	0.	P
2101-2933	21:01:01.6599	-29:33:27.836	0	90	0.67	0.56	0.48	0.	0.39	0.62	1.17	1.02	0.71	P
2101+0341	21:01:38.8341	+03:41:31.321	0	45	0.63	0.50	0.76	0.71	1.2	1.1	0.8	0.9	0.70	P
EM2107+4214	21:07:01.5930	+42:14:10.186	30	180	1.34	4.99	0.	0.	0.	7.33	6.07	5.02	4.97	X (NGC7027)
2109+3532	21:09:31.8787	+35:32:57.597	0	30	1.20	1.21	0.89	1.5	0.9	0.97	0.8	0.80	0.62	P
2115+2933	21:15:29.4134	+29:33:38.366	0	180	0.76	1.00	0.65	0.70	0.	0.	0.65	0.	0.	P
2123+0535	21:23:44.5173	+05:35:22.093	0	180	0.79	4.5	2.7	7.0	2.2	1.21	1.5	1.0	0.56	P
2129-1538	21:29:12.1759	-15:38:41.040	0	180	0.59	1.53	1.65	0.70	1.07	0.	0.7	0.	0.	P
E2131-1207	21:31:35.2617	-12:07:04.795	0	180	1.77	3.00	3.10	3.50	2.13	1.91	2.17	1.29	1.01	P

Table 1. continued.

IAU NAME HHMM+DDMM	RA (J2000) HH MM SS.SSSS	DEC DDD MM SS.SSS	MIN (arcsec)	MAX (arcsec)	S20 Jy	S6 Jy	S3.5 Jy	S2 Jy	S1.3 Jy	S0.9 Jy	S0.7 Jy	S0.5 Jy	S0.3 Jy	Code
2134-0153	21:34:10.3096	-01:53:17.238	0	180	1.69	2.70	1.67	2.10	2.11	2.19	1.88	2.22	1.82	P
E2136+0041	21:36:38.5863	+00:41:54.213	0	540	3.47	9.90	7.03	4.00	4.4	4.41	2.50	2.39	1.66	P
2137+5101	21:37:01.0015	+51:01:36.079	0	360	1.69	1.36	1.00	0.	0.	0.	0.70	0.	0.	P
2139+1423	21:39:01.3092	+14:23:35.991	0	540	1.13	1.40	1.22	1.8	2.2	2.64	2.48	1.30	0.73	P
2146-1525	21:46:22.9793	-15:25:43.885	0	180	0.73	0.60	0.50	0.40	0.45	0.64	0.40	0.	0.44	P
2147+0929	21:47:10.1629	+09:29:46.672	0	180	0.96	1.30	0.82	0.60	0.	0.73	0.55	0.	0.44	P
E2148+0657	21:48:05.4586	+06:57:38.604	0	720	2.59	2.50	6.60	3.00	8.0	4.63	3.77	3.43	2.93	P
2151+0709	21:51:31.4293	+07:09:26.783	0	45	0.88	0.70	0.70	0.50	0.	0.	0.40	0.	0.	P
2151-3027	21:51:55.5240	-30:27:53.698	0	90	1.24	1.10	1.12	0.70	1.85	1.01	1.10	1.5	0.69	P
2152+1734	21:52:24.8194	+17:34:37.794	0	180	0.68	0.70	0.63	0.8	0.	0.	0.7	0.	0.	P
2156-0037	21:56:14.7579	-00:37:04.594	0	45	0.23	0.52	0.36	0.	0.36	0.70	0.	0.	0.67	P
2158-1501	21:58:06.2819	-15:01:09.328	0	540	3.02	3.09	2.62	1.30	1.90	1.87	1.65	1.37	0.98	P
2201+5048	22:01:43.5372	+50:48:56.388	0	180	0.77	0.82	0.81	0.6	0.	0.	0.	0.	0.	P
2202+4216	22:02:43.2913	+42:16:39.979	0	720	6.05	5.40	3.95	3.50	3.4	4.33	4.26	3.89	3.68	P
E2203+3145	22:03:14.9757	+31:45:38.269	0	15	2.5	1.40	3.70	1.10	2.7	2.82	2.39	2.85	2.18	P
2203+1725	22:03:26.8936	+17:25:48.247	0	45	0.59	0.83	0.99	1.7	1.5	1.20	1.22	1.12	1.16	P
2206-1835	22:06:10.4170	-18:35:38.746	0	720	6.40	4.42	3.34	2.20	2.03	1.68	1.46	1.27	0.82	P
2212+2355	22:12:05.9663	+23:55:40.543	0	180	0.56	0.81	0.95	0.50	1.3	0.95	1.0	1.1	0.	P
2213-2529	22:13:02.4979	-25:29:30.079	0	45	1.21	1.20	0.75	1.30	0.80	0.82	0.5	0.	0.62	P
2217+2421	22:17:00.8211	+24:21:45.958	0	180	0.53	0.69	0.60	0.7	0.	0.57	0.7	0.	0.46	P
2218-0335	22:18:52.0377	-03:35:36.879	0	90	2.22	3.70	1.82	1.50	1.73	1.10	1.8	0.98	0.79	P
2225+2118	22:25:38.0471	+21:18:06.414	0	360	1.84	1.02	1.42	0.6	0.8	1.87	2.16	1.28	1.19	P
E2225-0457	22:25:47.2592	-04:57:01.390	0	180	7.41	3.80	5.60	6.60	8.32	6.15	4.39	4.10	3.13	P
2226+0052	22:26:46.5370	+00:52:11.331	0	90	0.62	0.47	0.52	0.5	0.	0.62	0.6	0.	0.	P
2229-0832	22:29:40.0843	-08:32:54.435	0	180	0.97	1.10	2.30	1.40	3.23	1.92	1.77	2.08	1.95	P
2230-3942	22:30:40.2785	-39:42:52.066	30	15	0.36	0.46	0.57	0.60	0.49	0.	0.46	1.06	0.72	P
E2232+1143	22:32:36.4089	+11:43:50.904	0	540	7.20	4.20	2.75	3.40	3.4	3.80	3.56	2.89	2.35	P
2236+2828	22:36:22.4708	+28:28:57.413	0	360	1.10	2.00	0.90	1.50	1.1	1.78	2.25	1.81	1.59	P
2236-1433	22:36:34.0871	-14:33:22.189	0	180	0.54	0.84	0.56	0.4	0.31	0.	0.	1.06	0.83	P
2241+0953	22:41:49.7173	+09:53:52.445	0	45	0.48	0.90	0.60	0.6	0.	0.	0.6	0.	0.	P
2244+4057	22:44:12.7319	+40:57:13.617	0	45	0.23	0.16	0.23	0.	0.	0.95	0.	0.	0.88	P
2246-1206	22:46:18.2319	-12:06:51.277	0	540	1.88	2.80	2.40	2.60	2.72	1.50	1.10	1.43	1.23	P
2247-3657	22:47:03.9173	-36:57:46.303	0	180	1.26	1.06	1.13	0.	0.94	0.78	0.	0.	0.66	P
2247+0310	22:47:58.6821	+03:10:42.353	0	45	0.82	0.59	0.80	0.8	0.	0.	1.2	0.	0.	P
2248-3235	22:48:38.6857	-32:35:52.187	0	45	0.71	1.04	1.41	0.4	1.47	0.	0.8	0.	0.43	P
2249+2107	22:49:00.5667	+21:07:02.835	0	180	0.77	0.72	0.71	0.8	0.	0.	0.	0.	0.	P
2250+5550	22:50:42.8510	+55:50:14.580	0	45	0.39	0.47	0.30	0.	0.	0.	0.46	0.	0.	P
2253+1942	22:53:07.3691	+19:42:34.628	0	45	0.26	0.36	0.35	0.	0.	0.	0.46	0.	0.	P
E2253+1608	22:53:57.7479	+16:08:53.560	0	720	12.66	10.00	10.90	15.00	7.4	16.84	22.75	27.91	28.83	P
2254+1341	22:54:21.0162	+13:41:48.675	0	90	1.42	0.88	0.58	0.	0.	0.	0.	1.47	0.83	P
2255+4202	22:55:36.7078	+42:02:52.532	0	180	1.90	1.00	0.90	0.6	1.0	0.7	0.6	0.	0.	P
2256-2011	22:56:41.2077	-20:11:40.509	0	45	0.34	0.45	0.46	0.	1.00	0.85	0.8	0.	0.	P
2257+0243	22:57:17.5630	+02:43:17.511	0	45	0.21	0.50	0.39	0.	0.	0.	0.5	0.	0.	P

Table 1. continued.

IAU NAME HHMM+DDMM	RA (J2000) HH MM SS.SSSS	DEC DDD MM SS.SSS	MIN (arcsec)	MAX (arcsec)	S20 Jy	S6 Jy	S3.5 Jy	S2 Jy	S1.3 Jy	S0.9 Jy	S0.7 Jy	S0.5 Jy	S0.3 Jy	Code
2258-2758	22:58:05.9628	-27:58:21.256	0	360	1.25	1.70	3.75	2.60	2.04	3.50	3.26	2.25	1.93	P
2301-0158	23:01:07.9784	-01:58:04.585	0	45	0.37	0.70	0.55	0.	1.13	0.	0.	0.	0.72	P
2301+3726	23:01:27.7374	+37:26:49.243	0	45	0.49	0.44	0.38	0.	0.	0.	0.66	0.	0.	P
2311+3425	23:11:05.3290	+34:25:10.900	0	45	0.98	0.99	0.64	0.6	0.	0.99	1.38	0.99	0.89	P
2314-3138	23:14:48.5006	-31:38:39.526	0	90	0.83	0.53	0.66	0.	0.63	1.01	0.46	0.	0.56	P
2320+0513	23:20:44.8565	+05:13:49.952	0	180	0.54	0.60	1.15	1.10	0.	0.97	1.1	0.	0.65	P
2321+2732	23:21:59.8622	+27:32:46.443	0	45	1.32	0.70	1.00	0.60	0.	0.86	0.60	0.	0.	P
2322+4445	23:22:20.3580	+44:45:42.353	0	45	0.36	0.36	0.37	0.	0.8	0.9	0.	0.	0.	P
2322+5057	23:22:25.9821	+50:57:51.963	0	180	1.29	1.4	1.60	1.60	0.9	0.99	0.6	0.	0.	P
2323-0317	23:23:31.9537	-03:17:05.023	0	45	0.93	0.80	0.90	0.7	1.24	0.	0.8	0.9	0.68	P
2327+0940	23:27:33.5805	+09:40:09.462	0	180	0.74	0.64	0.74	1.1	0.8	1.17	1.1	1.1	0.67	P
2330+3348	23:30:13.7376	+33:48:36.471	0	45	0.20	0.44	0.47	0.8	0.8	0.8	0.4	0.	0.	P
2330+1100	23:30:40.8522	+11:00:18.709	0	180	1.20	1.00	1.10	0.9	1.0	1.13	0.5	0.	0.	P
2331-1556	23:31:38.6524	-15:56:57.009	0	45	1.34	1.26	1.05	0.70	0.79	0.75	1.0	0.	0.63	P
2333-2343	23:33:55.2378	-23:43:40.657	0	45	0.78	0.66	0.77	0.90	0.96	1.16	0.9	1.06	0.77	P
2334+0736	23:34:12.8281	+07:36:27.552	0	90	0.63	1.37	0.97	1.3	1.1	1.09	1.6	0.	0.55	P
2337-0230	23:37:57.3390	-02:30:57.629	0	90	0.65	0.68	0.42	0.	0.57	0.74	0.54	0.	0.65	P
2346+0930	23:46:36.8385	+09:30:45.514	0	180	1.80	1.70	1.15	1.2	1.2	0.97	0.8	0.	0.	P
E2348-1631	23:48:02.6085	-16:31:12.022	0	540	2.64	2.49	3.29	1.80	2.45	1.96	2.03	1.89	1.50	P
2349+0534	23:49:21.0519	+05:34:39.849	0	45	0.44	0.35	0.26	0.	0.	0.	0.63	0.	0.	P
2354+4553	23:54:21.6802	+45:53:04.236	0	180	1.87	0.96	1.01	1.2	1.6	1.2	1.1	0.9	1.2	P
2354-1513	23:54:30.1951	-15:13:11.213	0	180	0.87	0.89	0.96	0.6	1.10	0.	0.	0.	0.	P
2355+4950	23:55:09.4581	+49:50:08.340	0	360	2.31	1.60	1.00	0.90	0.9	0.8	0.	0.	0.	P
2356+8152	23:56:22.7937	+81:52:52.255	0	180	0.52	0.41	0.49	0.5	0.8	0.86	0.6	0.8	0.53	P
2357-1125	23:57:31.1975	-11:25:39.176	0	180	1.81	1.50	1.25	0.80	0.80	0.	0.85	0.	0.	P
2358-1020	23:58:10.8824	-10:20:08.611	0	180	0.77	1.30	1.18	1.15	1.24	1.40	0.9	0.	0.72	P
2358+1955	23:58:46.0851	+19:55:20.302	0	45	0.67	0.71	0.52	0.5	0.	0.	0.4	0.	0.	P

Table 2. Flux density calibrator candidates for the SRT. Coordinates and flux density values as in Table 1 with the exception of 3C123 and DR21 whose parameters have been retrieved from NED and Dent (1972), respectively. If there is no usable value for the flux density (or for any other parameter) available, the value is listed as either a 0 or a – sign.

NAME	RA (J2000) HH MM SS.SSSS	DEC DDD MM SS.SSS	MIN (arcsec)	MAX (arcsec)	S20 Jy	S6 Jy	S1.3 Jy
3C48	01:37:41.2994	+33:09:35.132	0	720	16.02	5.48	1.13
3C123*	04:37:04.3752	+29:40:13.818	60	–	47.20	16.21	3.51
3C147	05:42:36.1379	+49:51:07.233	0	540	22.88	7.94	1.7
3C286	13:31:08.2879	+30:30:32.958	0	720	14.90	7.47	2.2
3C295	14:11:20.63	+52:12:09.0	15	540	22.72	6.76	0.
DR21*	20:37:14.0	+42:29:46	–	–	–	–	19.11
NGC7027**	21:07:01.5930	+42:14:10.186	30	180	1.34	0.	0.

* Partly resolved at Effelsberg. DR21 is bright at high frequency. 3C123 is bright at low frequency.

** A recent paper by Zijlstra et al. (2008) takes into account the expansion of NGC7027 and provides time dependent flux densities for this source.

Table 3. Polarization calibrator candidates for the SRT. Bold: primary polarization standards. Italics: primary low polarization leakage calibrators. Coordinates and flux density values as in Table 1. Polarization properties, i.e., percentage polarization and angle are taken from “<https://science.nrao.edu/facilities/vla/docs/manuals/obsguide/modes/pol>”. At this latter site more details on the polarization calibrator catalog and selection strategy can be found. If there is no usable value for the flux density (or for any other parameter) available, the value is listed as either a 0 or a –sign.

NAME	RA (J2000) HH MM SS.SSSS	DEC DDD MM SS.SSS	S20 Jy	P ₂₀	θ_{20}	S6 Jy	P ₆	θ_6	S1.3 Jy	P _{1.3}	$\theta_{1.3}$
3C48*	01:37:41.2994	+33:09:35.132	16.02	0.5	140	5.48	4.2	-72	1.13	7.7	-70
<i>3C84</i>	03:19:48.1601	+41:30:42.103	22.83	–	–	23.3	0.05	–	11.3	0.05	–
3C138	05:21:09.8860	+16:38:22.051	8.60	7.5	-11	3.78	10.4	-11	0.	6.7	-16
3C147	05:42:36.1379	+49:51:07.233	22.88	<0.5	–	7.94	0.3	0	1.7	3.8	75
<i>0713+4349</i>	07:13:38.1641	+43:49:17.206	2.01	–	–	1.57	–	–	0.55	–	–
3C286**	13:31:08.2879	+30:30:32.958	14.90	9.5	33	7.47	11.4	33	2.2	12.6	35
<i>OQ208</i>	14:07:00.3944	+28:27:14.689	0.82	–	–	2.80	–	0.	–	–	–
<i>2355+4950</i>	23:55:09.4581	+49:50:08.340	2.31	–	–	1.60	–	–	0.9	–	–

* Weak at high frequency. Depolarized below 4 GHz.

** It is the foremost primary calibrator and should be used if available.