Figure 1: Comparison of FAST and ALFALFA galaxy velocity widths. The FAST w50 errors have been magnified 3 times to make them visible.

1 Analysis of galaxies in the Siena galaxy atlas

1.1 Velocity widths

Zhang et al. (2024) have provided optical identification for 10976 of their sources with the Siena Galaxy Atlas (SGA, Moustakas et al. 2023). From the grz photometry of the SGA we chose the z band for the Tully Fisher Relation, because of its lesser problems with internal galactic extinction. The SGA authors used profile fitting to obtain total magnitudes for their galaxies, simultaneously solving for ellipticity, and they catalog axial ratios, which are necessary for the TFR. Zhang et al. have compared their detection velocities with those of the ALFALFA survey, (Haynes et al. 2018) finding good agreement. In Figure 1 we compare their w50 values with those of ALFALFA. The agreement is also good.

In the TFR we use Wmx, the width after correction for resolution and turbulence following Tully & Fouqué (1985). We define $\Delta V(0) = $ Wmx $/ \sin i /(1+\text{z})$, where z is the redshift of the galaxy and i is the inclination derived from its axial ratio. Figure 2 shows how the FAST galaxies' w50s that have Siena atlas total z magnitudes are distributed in redshift. Noticeably, the lowest wmx values fall away at higher redshift, as they are too faint for the atlas. The numbers reflect the FAST 14000 galaxies overall (the histogram).
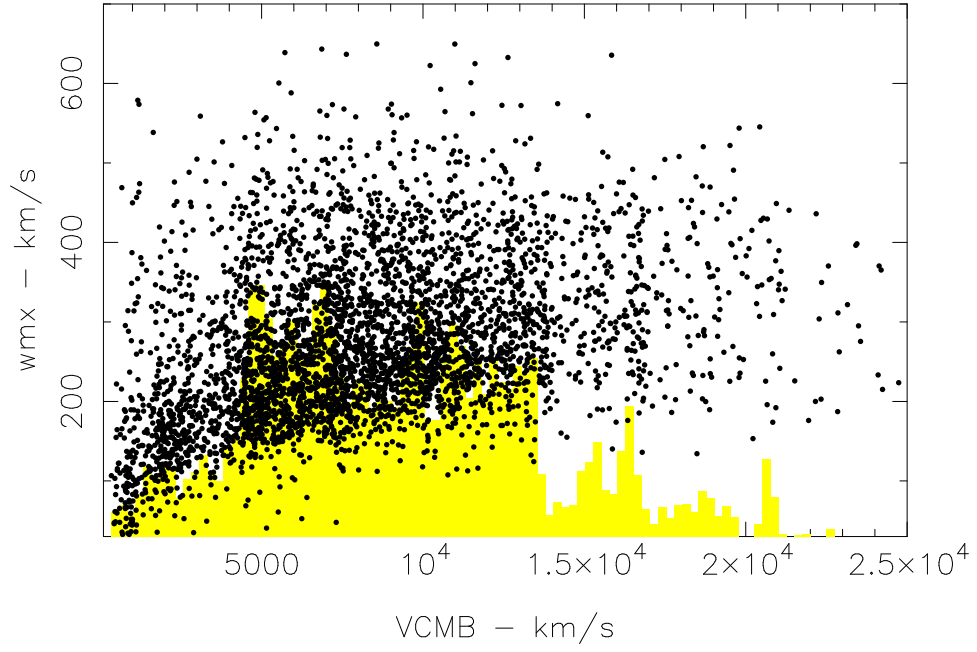
1

Figure 2: FAST's Siena galaxy velocity widths are plotted against their recession velocities in the cosmic microwave background frame. The underlying histogram is the distribution of all FAST 2023 sources from Zhang et al. (2024).

2   The baryonic Tully Fisher Relation

For measuring distances CF4 uses the baryonic TFR. Using the $g - r$ colour we derive the galaxy's M^*/L_z from equation (1) of Taylor et al. (2015), modified using,

$$g - i = 1.408(g - r - 0.753) + 1.14 \quad \text{and} \quad i - z = 0.03(g - r - 0.753) + 0.235$$

obtained from tight colour-colour relations fitted to $ugriz$ photometry of Hydra galaxies by Lima-Diaz et al. (2021). The adopted relation is,

$$\log M* = 0.974(g - r) + 0.802 - 0.4M_z$$

We normalized the M* values so obtained to those of 850 galaxies in the FAST-SGA sample that also appear in the CF4 catalogue. This normalization has an uncertainty of 0.0046 dex. We similarly normalized the FAST HI masses to the gas masses of the CF4 catalogue with an uncertainty of 0.018 dex. The combined uncertainty of the zeropoint of the baryonic TFR in Figure 3 is closer to the M* zeropoint uncertainty than the gas mass uncertainty as galaxies averagely have a gas mass less than their stellar mass. This normalization also brings the data into conformity with the Hubble Constant present in the CF4 catalogue.

The green points in Figure 3 are matches of two FAST sources to the same galaxy, and these have been resolved by selecting the point closer to the mean TFR. The blue points are 2.5σ disagreements between FAST/Siena and CF4. These scatter considerably, and are rejected from the sample. The red dashed line is a line of slope 3 through the data and the small red error bar in the top left is the average baryonic mass uncertainty. A few of the bigger ones are marked. Objects with fractional FAST w50 errors exceeding 4.7% were then rejected, cleaning up some of the overluminous scatter. The formal w50 error bars are present in Figure 3, but seem likely to be underestimated, as Zhang et al. set them equal to twice the velocity uncertainty, an approximation the would only be satisfactory for high signal to noise HI profiles. The z band magnitudes were corrected for extinction using the Caltech-IPAC E(B-V) values for each galaxy individually (Schafly & Finkbeiner 2011). These are small corrections. The biggest E(B-V) was 0.2 and the median < 0.02 mag. $A_z/E(B-V) = 1.263$. For some 282 galaxies the NASA Extragalactic Database[1] (NED) did not recognise the PGC number, but these turned out to be a biased set of objects on the TFR, and these were removed from the sample too, supposing the association of the Siena galaxy and the FAST source was at least doubtful. Finally, the red points were removed from the distance measurement sample as 2.5σ deviates from the TFR fit shown by the dashed line.

2.1   Distance measurement

Figure 4 is the ratio of distance from the baryonic TFR to redshift distance. The spread is due to TFR scatter and peculiar velocities. The different colour

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[1] https://ned.ipac.caltech.edu
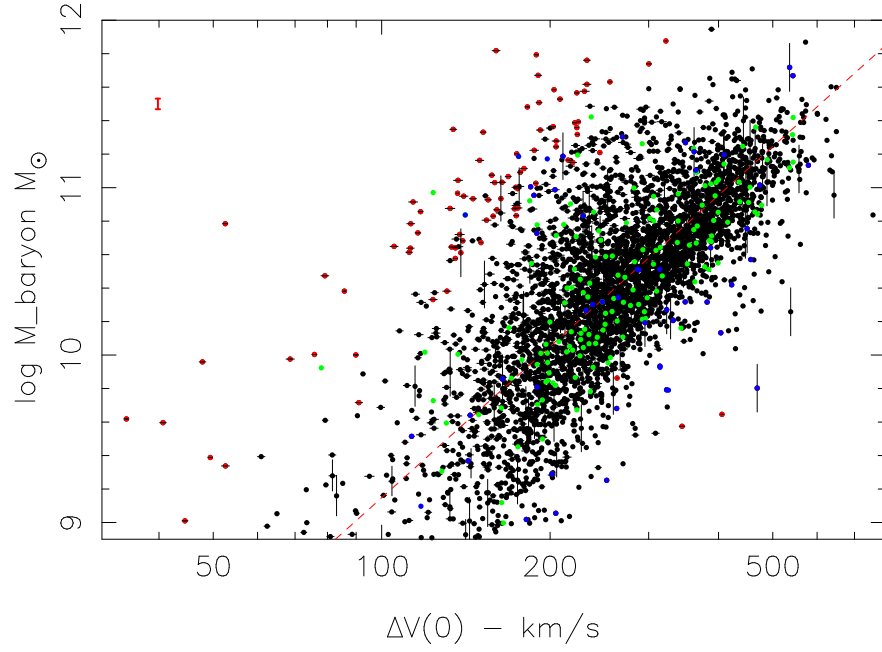
Figure 3: The baryonic TFR for the FAST-Siena sample. Green points denote two FAST sources associated with the same SGA galaxy. The same applies to the blue points which were rejected from the distance measurement sample. The dashed curve is a least squares fit with slope 3, which fits the 10,000 galaxies in CF4 catalogue. Red points are 2.5σ deviates from that fit, and the red error bar in the top left is the average formal uncertainty of the data points. The largest baryonic mass uncertainties are plotted with individual error bars.

Figure 4: The ratio of TFR distances to redshift distances after correction for Malmquist bias using a smooth function of velocity. The different 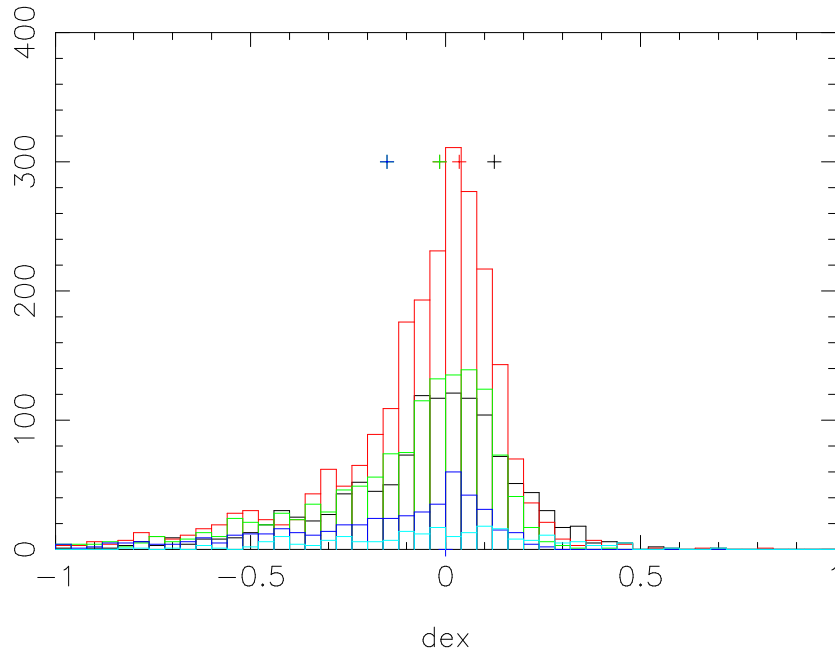colour histograms are 0-1600 km/s (light blue), 0-5000 km/s (black), 5000-10000 (red), 10000-15000 (green) and above 15000 km/s (blue). Before bias correction the modes of the histograms were located where the plus signs are plotted.

histograms are 0-1600 km/s (light blue), 0-5000 km/s (black), 5000-10000 (red), 10000-15000 (green) and above 15000 km/s (blue). The mode of all histograms is almost the same. This equality of modes was obtained by multiplying the distances by a smooth function of redshift to remove the original trend. The positions of the original modes is shown by the plus signs. This correction is to remedy Malmquist bias. If the correction is omitted, the value of H_0 for the dataset rises by the spread in the plus signs with increasing redshift, a sure sign of Malmquist bias. Figure 5 is the distribution of these corrections.

3 Analysis of galaxies identified with Sloan Digital Sky Survey galaxies

Some 14070 FAST 2023 galaxies are identified with SDSS objects. We cross-matched these objects with DELVE DR2 objects from the DECam Local Volume Exploration Survey (DELVE DR2 catalog, Drlica-Wagner et al. 2022) with a matching radius of 7". Based on images with the Dark Energy Camera at Cerro Tololo in Chile, DELVE has limited coverage of the northern hemisphere. The
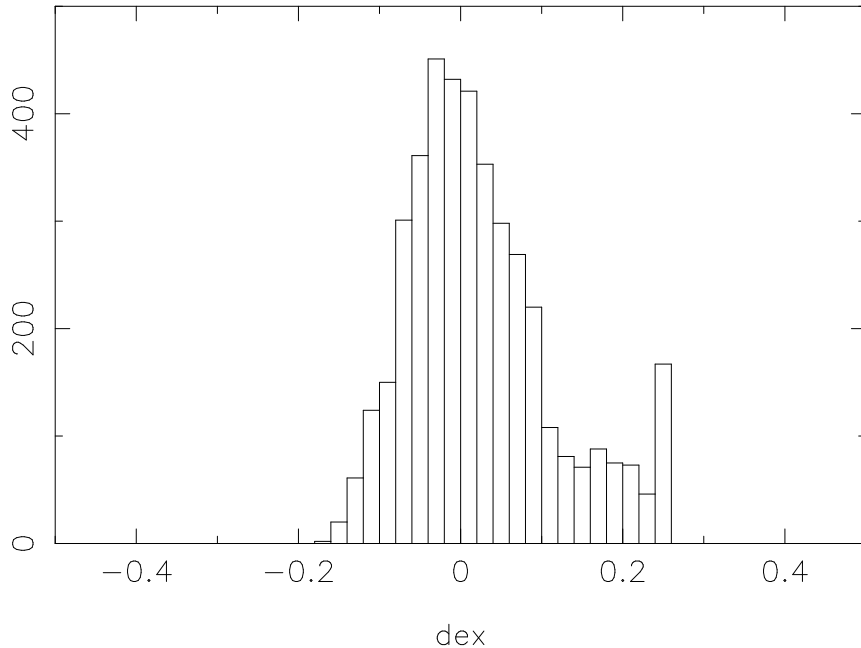
Figure 5: The distribution of individual Malmquist bias corrections.

results are in Figure 6, where the colour coding is similar to Figure 4, except that red objects are within $30°$ of the Galactic equator. This is not a problem, as the DELVE catalogue lists A_i for each object. Figure 7 shows the baryonic TFR after normalization of M* using the full sample of DELVE DR2 galaxies that are in the CF4 catalog, only one of which is a FAST detection. This zeropoint is determined by 54 galaxies to 0.06 dex in logM*, but neverless secures a value of H_0 for the 350 galaxies SDSS sample, which is the same as for the CF4 catalogue. This assures us that spurious large scale flow fields are not added to the CF4 dataset. Table 1 gives distances for these galaxies and DELVE DR2 positions, and the notes supply legacy galaxy names. The rms difference between the FAST positions and the DELVE positions was $29"$, and separations of more than $2'$ are marked in the table with asterisks. Distance moduli are obtained from the baryonic TFR, and the uncertainty in column (7) is a combination of the velocity width errors, the HI mass errors and the magnitude errors, plus 0.32 mag obtained by comparing the distance uncertainties for 806 SGA galaxies with the uncertainties listed in the CF4 catalogue. This addition reflects the scatter in the baryonic TFR.

References

Drlica-Wagner, A. et al. 2022, ApJS, 261, 38
Haynes, M. et al. 2018, ApJ, 861, 49
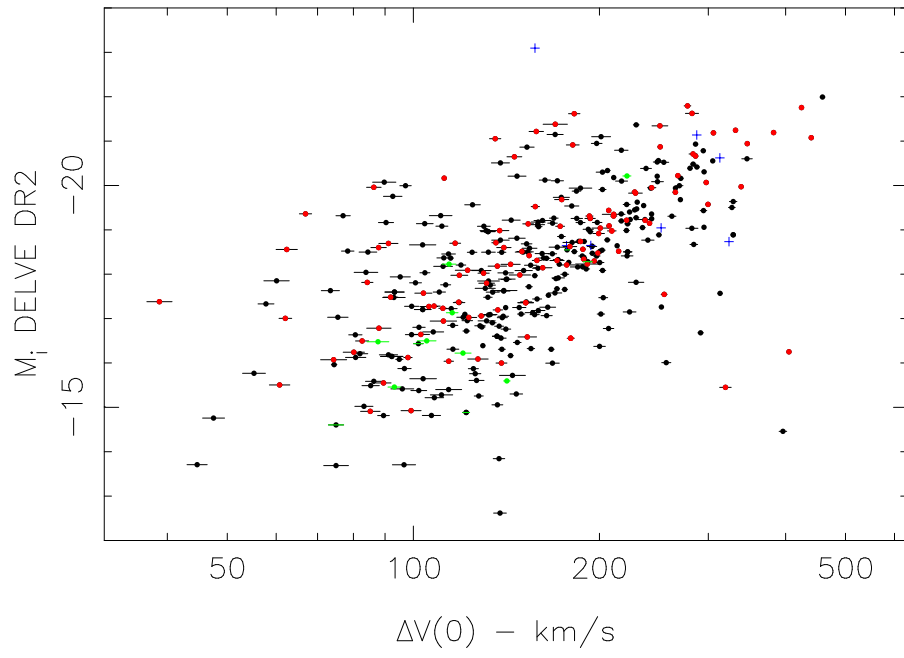
Figure 6: TFR in i magnitudes from the DELVE DR2 catalogue. The colour coding is similar to Figure 4, except that red denotes low absolute galactic latitude. For clarity magnitude error bars are not shown, but they can be seen in Figure 7.
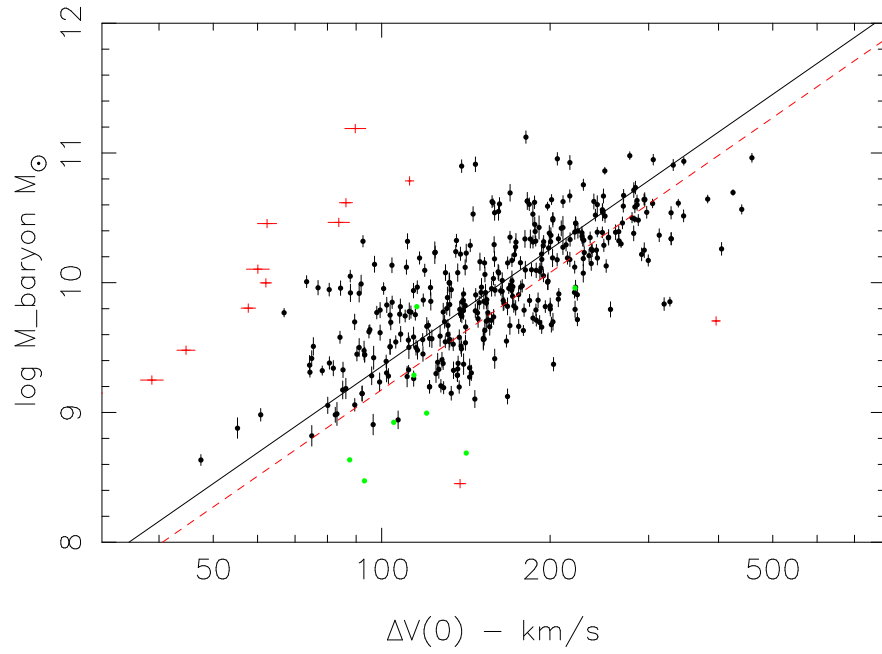
Figure 7: The baryonic TFR for the SDSS identified sample. Green points are multiple identifications, resolved individually. Red points are 2.5σ deviates from the fitted solid line, discarded from the distance sample. The dashed red line is the calibration line from Figure 4. Horizontal error bars are only shown for the red points, the others being smaller.

Lima-Diaz, C. et al. 2021, MNRAS, 500, 1323

Moustakas, J. et al. 2023, ApJS, 269, 3

Schlafly, E. & Finkbeiner, D. 2011, ApJ, 737, 103

Tully, R.B. & Fisher, J.R. 1977, A&A, 54, 661

Tully, R.B. & Fouqué, P. 1985, ApJS, 58, 67

Zhang, C.-P. et al. 2024, Science China Physics, Mechanics & Astronomy, 67, 219511

Table 1: SDSS identified FAST galaxies and DELVE DR2 positions

| FAST ID | FAST # | RA (2000) | Dec | v$_{CMB}$ | m-M | ± | Note |
| | | deg | deg | km/s | mag | mag | |
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
J000008.33-050927.1	20230060201	0.0470	-5.1589	3363	34.88	0.37	1a
J000208.31-021201.3	20230003487	0.5406	-2.1994	8158	35.63	0.41	
J000402.80-053802.9	20230060116	1.0189	-5.6399	4104	33.32	0.38	
J000512.67-013319.2	20230004037	1.3110	-1.5534	5343	35.15	0.40	
J000842.38-043711.0	20230001484	2.1901	-4.6325	6284	35.49	0.40	
J000849.99-021808.8	20230003404	2.2134	-2.2973	5346	34.03	0.45	
J001513.21-015441.5	20230060355	3.8050	-1.9072	9498	35.47	0.41	
J001635.88-013608.2	20230004008	4.1496	-1.6056	5061	32.27	0.39	
J001747.29-030908.1	20230002768	4.4460	-3.1635	5222	32.99	0.39	
J001902.66-030647.3	20230060271	4.7649	-3.1172	10926	35.39	0.41	
J002117.36-030338.4	20230002844	5.2933	-3.0857	15873	34.35	0.42	*
J002354.91-024327.0	20230003080	5.9875	-2.7276	11794	35.48	0.43	
J002736.36-014527.8	20230003886	6.9026	-1.7889	3689	32.39	0.37	
J003100.83-050931.6	20230060200	7.7168	-5.1651	1822	29.73	0.42	*
J003111.38-015913.8	20230060334	7.7999	-1.9851	7557	35.22	0.38	
J003156.24-051101.5	20230060198	7.9784	-5.1824	1804	31.35	0.38	
J003224.61-043520.7	20230001504	8.1039	-4.6002	4622	33.36	0.41	
J003233.57-042413.3	20230001658	8.1394	-4.3802	12710	35.74	0.40	
J003315.79-042726.7	20230001616	8.3215	-4.4641	4657	34.35	0.39	
J003407.12-024532.7	20230003062	8.5305	-2.7654	5826	34.11	0.41	
J003428.75-021337.1	20230003461	8.6222	-2.2267	5082	32.46	0.39	2
J003556.45-030545.7	20230002817	8.9874	-3.0981	5418	35.00	0.37	
J003609.04-025601.2	20230053073	9.0393	-2.9469	12086	36.89	0.39	
J003757.11-043145.1	20230001561	9.4987	-4.5359	12744	35.64	0.42	
J003811.64-022000.8	20230003375	9.5524	-2.3306	9628	35.83	0.37	
J004951.02-053702.3	20230060120	12.4474	-5.6052	5244	33.84	0.41	
J005319.23-030148.7	20230053397	13.3297	-3.0281	12929	34.67	0.42	
J005347.64-023659.4	20230003155	13.4519	-2.6116	15381	37.22	0.37	
J005425.32-021936.3	20230003382	13.6069	-2.3286	5124	32.82	0.42	
J005735.53-025649.5	20230002930	14.4000	-2.9474	5221	33.76	0.41	
J005827.79-043311.7	20230001537	14.6265	-4.5644	5249	33.39	0.42	
J010107.04-023008.4	20230003282	15.2915	-2.5055	13409	37.54	0.37	
J010144.85-043315.2	20230001535	15.4345	-4.5509	11804	35.43	0.38	
J010236.75-020637.5	20230060305	15.6549	-2.1100	11979	36.10	0.38	
J010237.66-043732.4	20230001480	15.6631	-4.6410	11819	36.31	0.38	
J010316.97-024423.6	20230060286	15.8207	-2.7378	11155	36.48	0.39	
J010408.69-024817.5	20230053174	16.0348	-2.8131	11768	36.25	0.43	
J010440.56-051932.1	20230060177	16.1819	-5.2950	6569	34.68	0.36	
J010749.35-031553.2	20230051907	16.9608	-3.2682	5365	34.80	0.41	

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Table 1 – *Continued*

J011302.28-033249.8	20230053389	18.2701	-3.5497	7451	34.97	0.39	
J011513.65-031117.4	20230002739	18.8054	-3.1945	8231	33.92	0.41	
J011530.15-051411.3	20230060192	18.8797	-5.2318	4976	34.02	0.40	
J011551.19-030303.7	20230053172	18.9666	-3.0548	10783	35.36	0.38	
J011658.44-045607.9	20230053394	19.2380	-4.9395	11506	35.27	0.42	
J011814.34-032655.1	20230053390	19.5621	-3.4476	7668	35.39	0.40	
J011859.20-021928.5	20230053173	19.7508	-2.3195	11533	36.38	0.39	
J012230.19-015950.9	20230060331	20.6381	-1.9998	4696	33.73	0.40	
J012313.19-052828.4	20230060153	20.8116	-5.4651	5496	32.75	0.39	
J012709.78-015512.4	20230060351	21.7893	-1.9202	9787	34.56	0.43	
J012914.15-025104.8	20230003005	22.3147	-2.8522	5231	33.98	0.38	
J013042.23-021402.6	20230003456	22.6746	-2.2375	5001	32.96	0.38	
J013137.80-044025.6	20230001428	22.9119	-4.6883	1715	31.32	0.39	
J013325.06-031331.4	20230002705	23.3544	-3.2120	12658	35.30	0.39	
J013500.32-020352.6	20230060317	23.7500	-2.0600	8722	35.60	0.44	
J013655.55-050245.7	20230001106	24.2235	-5.0126	5293	33.82	0.38	3a
J013754.75-030616.6	20230002810	24.4843	-3.1020	12754	37.36	0.39	
J013806.16-050001.2	20230060215	24.5276	-5.0012	10591	35.24	0.40	
J013934.70-051346.9	20230001084	24.8946	-5.2296	3227	32.39	0.43	
J013949.04-023339.4	20230003200	24.9555	-2.5585	9658	33.98	0.43	
J014057.23-020509.9	20230060313	25.2388	-2.0879	9794	36.21	0.39	
J014158.85-032859.2	20230051873	25.4972	-3.4928	5407	34.28	0.41	
J014249.35-020714.8	20230060302	25.7088	-2.1231	5103	33.96	0.41	
J014327.22-032951.0	20230051870	25.8675	-3.5085	5304	34.08	0.41	
J014425.16-024034.8	20230003117	26.1066	-2.6726	4594	33.19	0.44	
J014511.11-032301.8	20230051876	26.2996	-3.3878	5414	33.81	0.42	
J014556.50-014831.1	20230051617	26.4877	-1.8119	2407	32.46	0.38	
J014816.75-033254.5	20230053413	27.0868	-3.5598	12147	36.26	0.40	
J015340.81-031701.4	20230053408	28.4261	-3.2882	11361	35.57	0.42	
J015342.67-025731.5	20230053046	28.4328	-2.9585	9062	35.93	0.39	
J015343.40-031035.7	20230053044	28.4365	-3.1799	9157	34.95	0.43	
J015343.66-024841.9	20230053398	28.4400	-2.8152	9132	34.85	0.41	
J015428.46-034802.9	20230053404	28.6214	-3.8020	9208	35.52	0.44	
J015436.78-034047.8	20230002243	28.6495	-3.6791	13495	36.56	0.38	
J015444.83-025024.0	20230003012	28.6918	-2.8451	12008	36.24	0.41	
J015453.97-015313.4	20230060361	28.7353	-1.8860	13037	36.50	0.39	
J020040.55-035230.1	20230002059	30.1713	-3.8862	13005	35.97	0.41	
J020234.59-041009.5	20230001845	30.6645	-4.1504	12747	35.64	0.38	
J020250.84-015948.6	20230060332	30.7148	-1.9975	11870	36.59	0.38	4
J020824.72-032849.3	20230053266	32.1074	-3.4874	10514	36.14	0.37	5a
J021514.26-043726.6	20230001481	33.8106	-4.6266	12468	34.30	0.41b	
J021549.05-015814.0	20230060341	33.9590	-1.9717	10700	35.19	0.41	
J021701.89-050336.9	20230053260	34.2591	-5.0641	7522	34.56	0.43	
J021809.76-055756.9	20230060044	34.5456	-5.9714	12377	36.66	0.38	

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Table 1 – *Continued*

J022018.24-021601.7	20230053184	35.0800	-2.2659	8402	36.29	0.38	b
J022733.54-014620.2	20230060376	36.8938	-1.7682	11230	36.24	0.40	
J022802.04-033926.0	20230002275	37.0113	-3.6652	6136	34.55	0.40	
J022935.44-033432.3	20230053269	37.3945	-3.5730	12176	34.23	0.41	
J022935.68-045342.0	20230053263	37.4059	-4.8995	8635	35.85	0.37	
J023044.67-020929.8	20230003529	37.6872	-2.1572	5504	32.97	0.39	
J023132.93-045433.2	20230053264	37.8906	-4.9110	8579	36.27	0.39	
J023407.76-033956.4	20230002260	38.5354	-3.6617	12807	36.40	0.39	
J023432.10-041757.5	20230001771	38.6526	-4.3090	9309	35.76	0.37	
J023552.03-013053.9	20230053177	38.9656	-1.5136	12747	35.69	0.38	
J023620.09-013351.7	20230051698	39.0862	-1.5611	6511	34.50	0.40	
J023737.72-022713.2	20230003299	39.4100	-2.4544	6172	34.46	0.38	b
J024427.64-045715.2	20230001185	41.1194	-4.9670	4261	33.20	0.43	
J024454.57-020334.6	20230003635	41.2364	-2.0705	12861	36.92	0.38	
J024513.84-045937.5	20230001161	41.3086	-4.9963	7783	35.53	0.38	
J024515.65-053810.0	20230060115	41.3193	-5.6407	8660	34.84	0.41	
J024523.66-034354.6	20230002204	41.3513	-3.7388	12692	34.87	0.40	
J024551.49-021500.5	20230003446	41.4744	-2.2476	12659	34.77	0.38	
J024646.28-032335.3	20230051802	41.6976	-3.3938	5518	34.06	0.42	
J024730.74-020827.3	20230003552	41.8818	-2.1406	6474	35.47	0.40	
J024932.91-023213.5	20230003226	42.3886	-2.5385	8325	35.62	0.37	
J025137.54-052704.4	20230060155	42.9087	-5.4485	6800	34.24	0.38	
J025142.07-022941.2	20230003264	42.9289	-2.4985	3979	33.97	0.39	
J025158.06-013845.3	20230051723	42.9993	-1.6488	3959	33.44	0.42	
J025534.62-023439.2	20230003178	43.9022	-2.5730	11365	36.70	0.38	
J025551.39-013455.6	20230053165	43.9703	-1.5790	7908	35.08	0.39	
J025706.07-060625.1	20230000845	44.2863	-6.1427	9302	35.15	0.40	*
J025740.09-015037.6	20230003803	44.4141	-1.8399	8190	35.07	0.42	
J025847.73-052249.3	20230053285	44.7148	-5.3848	9551	35.37	0.39	
J025911.21-012435.2	20230004154	44.7969	-1.4124	11398	37.50	0.37	
J025950.64-014610.0	20230051726	44.9626	-1.7748	5871	33.32	0.42	
J030126.15-022008.3	20230003374	45.3665	-2.3396	5842	34.29	0.36	
J030205.35-055943.6	20230000894	45.5274	-6.0031	7003	34.69	0.38	
J030237.28-012219.6	20230004165	45.6596	-1.3740	11468	35.73	0.39	
J030332.01-021754.6	20230003396	45.9136	-2.3132	8343	33.99	0.41	*
J030444.28+000148.3	20230051722	46.1885	0.0303	2492	31.73	0.46	
J032206.12-011537.3	20230004205	50.5268	-1.2584	6113	34.81	0.40	
J033325.48+000653.2	20230005066	53.3455	0.0988	6653	32.92	0.39	
J034628.04-052000.3	20230053387	56.6195	-5.3447	6981	33.52	0.41	
J035249.34-050838.3	20230051844	58.2068	-5.1397	3866	32.75	0.45	
J035412.41-054746.2	20230000955	58.5587	-5.7931	6345	34.83	0.40	
J035425.78-003044.0	20230004762	58.6209	-0.5191	10628	36.36	0.37	
J035649.83-052622.2	20230060156	59.2301	-5.4440	4680	32.43	0.41	
J035749.61-052335.8	20230060164	59.4821	-5.3984	11149	35.15	0.38	

Table 1 – *Continued*

J035955.90-004729.9	20230053096	59.9871	-0.7963	8582	35.69	0.36	
J040248.17-000155.4	20230005015	60.7056	-0.0284	3871	33.31	0.38	
J040612.89-002252.1	20230004870	61.5549	-0.3774	4995	33.93	0.41	
J040813.00-004521.4	20230004609	62.0627	-0.7539	7900	35.23	0.41	
J041305.93-044852.1	20230001288	63.2784	-4.8212	8327	35.32	0.42	
J041404.90-042258.0	20230001683	63.5206	-4.3931	4833	35.12	0.40	
J041438.03-040317.5	20230001909	63.6692	-4.0550	11086	36.59	0.39	
J041944.17-003853.1	20230004666	64.9441	-0.6547	5032	34.24	0.39	
J042107.04-034827.8	20230002124	65.2848	-3.8116	10252	34.89	0.41	
J042127.85-034828.1	20230002123	65.3708	-3.8117	12151	36.22	0.37	
J042305.17-002434.3	20230004835	65.7676	-0.4116	3373	33.33	0.46	
J042707.71-052834.8	20230060152	66.7870	-5.4760	3193	32.97	0.41	
J042710.69-040304.2	20230001911	66.7991	-4.0617	4574	33.54	0.41	
J042824.91-034529.3	20230002175	67.1067	-3.7603	4192	32.90	0.38	
J042853.60-042425.8	20230001656	67.2319	-4.4077	4903	33.64	0.38	
J042914.54-033217.6	20230002404	67.3152	-3.5567	4911	32.71	0.45	
J042919.32-001217.7	20230004949	67.3371	-0.2075	5041	33.58	0.38	6
J042926.28-034619.2	20230002159	67.3663	-3.7707	12983	36.66	0.40	
J043220.04-050006.7	20230001159	68.0587	-4.9686	3957	33.84	0.41	*
J043403.69-032424.8	20230002515	68.5329	-3.4342	4534	34.38	0.38	
J043748.30-034422.2	20230002195	69.4573	-3.7422	20442	34.75	0.39	
J043801.98-005615.2	20230004420	69.5104	-0.9431	2643	32.28	0.38	7b
J043940.23-050702.9	20230051835	69.9188	-5.1226	3669	33.74	0.40	
J044423.23-044533.8	20230001326	71.1219	-4.7599	9497	36.27	0.37	
J044507.42-045631.0	20230001194	71.2843	-4.9463	4955	33.56	0.39	
J044528.64-045256.7	20230001244	71.3740	-4.8828	4721	32.98	0.36	
J044642.12-041706.4	20230001787	71.6892	-4.2855	2838	30.61	0.39	
J045111.45-045440.4	20230001217	72.8032	-4.9179	3107	32.29	0.42	
J045225.41-045404.8	20230001225	73.1119	-4.9067	4861	33.45	0.39	
J045411.24-050502.5	20230051982	73.5497	-5.0852	4716	35.91	0.40	
J045415.85-043150.8	20230001559	73.5777	-4.5419	4909	32.72	0.42	
J045425.58-035107.4	20230060243	73.6049	-3.8544	4750	34.73	0.43	
J045436.97-040452.5	20230001892	73.6740	-4.0809	3792	32.95	0.41	
J045534.79-034743.6	20230002135	73.8994	-3.7978	4550	33.39	0.38	
J045627.42-010500.8	20230004309	74.1190	-1.0854	5787	33.66	0.40	
J045838.69-031903.1	20230002585	74.6656	-3.3138	11322	36.19	0.39	
J050000.24-004418.3	20230004595	75.0020	-0.7385	6472	34.12	0.39	
J050246.00-021708.1	20230003420	75.6971	-2.2849	4448	34.24	0.37	
J050810.08-015530.9	20230003735	77.0456	-1.9276	4179	32.66	0.41	
J050939.60-000923.6	20230004968	77.4149	-0.1528	8469	35.12	0.41	
J050944.31-051831.4	20230051976	77.4372	-5.3148	3818	33.63	0.40	
J051024.72-021635.2	20230003424	77.6102	-2.2760	7909	34.04	0.41	
J051145.05-030102.0	20230102822	77.9333	-3.0186	7388	36.09	0.34	8
J051233.33-030239.4	20230053061	78.1406	-3.0537	7385	36.26	0.38	

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Table 1 – *Continued*

J051245.49-022224.6	20230003352	78.1974	-2.3852	7723	34.14	0.41	
J051301.95-022348.2	20230003334	78.2587	-2.3995	7761	35.55	0.38	
J051317.96-005613.3	20230004421	78.3282	-0.9364	4476	34.20	0.38	
J051356.03-031306.0	20230002712	78.4840	-3.2111	4065	32.71	0.40	
J051540.60-024545.7	20230003061	78.9202	-2.7731	7369	34.35	0.39	
J051716.24-014508.1	20230003891	79.3245	-1.7484	2784	32.50	0.39	
J051814.32-022930.3	20230003268	79.5610	-2.4904	10304	33.90	0.42	
J051818.76-053525.6	20230060125	79.5874	-5.5893	11359	35.34	0.37	
J051827.16-051446.6	20230053526	79.6154	-5.2495	12009	34.55	0.39	
J051924.89-022822.9	20230053064	79.8578	-2.4774	10201	36.29	0.36	
J052039.94-044536.4	20230001324	80.1595	-4.7617	10835	35.15	0.39	
J052302.22-054849.1	20230060078	80.7605	-5.8232	10086	33.99	0.43	
J052400.28-052000.7	20230051931	81.0041	-5.3383	3747	32.51	0.36	
J052417.37-012741.2	20230004113	81.0772	-1.4662	4653	31.70	0.39	
J052444.30-053724.1	20230060119	81.1708	-5.6300	12413	34.64	0.41	
J052613.99-060431.1	20230060014	81.5405	-6.0835	12732	34.77	0.39	
J053135.46-023637.7	20230003156	82.9017	-2.6044	6460	34.68	0.44	
J053159.75-014510.6	20230003890	83.0054	-1.7606	4889	32.33	0.39	
J053527.61-001637.2	20230042173	83.8683	-0.2728	10628	35.73	0.41	
J053558.94-015821.3	20230003702	83.9968	-1.9799	4536	33.93	0.41	
J053646.82-003852.4	20230004668	84.1969	-0.6540	6770	34.40	0.37	
J053715.43-003716.8	20230004690	84.3124	-0.6260	12175	35.59	0.41	
J054015.80-001440.7	20230004925	85.0701	-0.2486	12403	36.45	0.36	
J054839.36-000818.0	20230042177	87.1698	-0.1419	12584	35.17	0.40	
J074004.65-002245.7	20230004871	115.0254	-0.3789	17525	35.58	0.44	
J075335.95-002716.9	20230004806	118.4079	-0.4626	12182	35.70	0.45	b
J075611.07-020517.9	20230003606	119.0477	-2.0919	1626	30.37	0.41	
J075800.83-020802.7	20230003553	119.5001	-2.1444	1668	29.38	0.42	
J080153.33-015415.1	20230003750	120.4760	-1.8922	6937	34.48	0.43	
J080349.71-002707.5	20230004808	120.9629	-0.4500	8904	36.11	0.39	
J080804.73-020620.1	20230003586	121.9834	-2.1060	5634	34.70	0.44	
J081403.45-004647.7	20230053148	123.5257	-0.7791	10601	36.03	0.39	
J081749.63-054242.4	20230000998	124.4613	-5.7181	12130	36.26	0.41	b
J081754.22-053627.2	20230001024	124.4786	-5.6147	8288	33.86	0.37	
J081820.43-020033.1	20230003677	124.5923	-2.0148	8088	35.25	0.39	
J081858.65-055204.7	20230000931	124.7556	-5.8731	13313	36.79	0.37	
J081930.04-050828.9	20230051793	124.8767	-5.1404	5267	33.77	0.41	
J082009.72-022530.8	20230003322	125.0383	-2.4307	4606	34.23	0.37	
J082043.43-020626.4	20230003585	125.1829	-2.1193	12501	36.47	0.38	
J082146.68-005633.4	20230053147	125.4512	-0.9389	10614	36.10	0.41	
J082148.75-020619.1	20230003587	125.4627	-2.1065	15369	36.67	0.46	
J082353.24-005606.7	20230004422	125.9671	-0.9300	11538	35.53	0.42	
J082444.15-041027.9	20230001841	126.1833	-4.1824	7000	35.14	0.38	
J082503.49+300201.2	20230060532	126.2558	30.0346	7836	36.88	0.40	

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J082610.67-050323.8	20230001107	126.5469	-5.0559	7084	35.00	0.37	
J082817.58-021903.3	20230003392	127.0761	-2.3149	4650	33.66	0.39	
J083103.41-054907.5	20230000951	127.7726	-5.8076	6253	32.78	0.39	
J083126.60-023914.7	20230051666	127.8568	-2.6168	3249	32.19	0.43	*
J083135.45-053406.1	20230001038	127.9040	-5.5686	10160	36.87	0.35	
J083541.58-030033.1	20230002880	128.9181	-3.0077	12333	36.01	0.41	
J083610.06-022430.2	20230003331	129.0452	-2.4120	7289	34.88	0.45	
J083612.70-032901.4	20230053459	129.0539	-3.4869	12571	35.60	0.43	b
J083645.06-021325.9	20230003462	129.1936	-2.2256	7401	35.00	0.41	
J083714.30-013550.9	20230004011	129.3115	-1.5961	4475	34.14	0.38	
J084137.25-014129.3	20230003940	130.4094	-1.6983	5430	33.90	0.43	
J084216.12-031135.3	20230002737	130.5639	-3.2028	10093	35.47	0.42	
J084341.24-020037.5	20230003676	130.9286	-2.0196	5474	34.48	0.43	
J084459.43-005139.8	20230004481	131.2463	-0.8662	3853	32.62	0.44	
J084650.35-020452.3	20230003614	131.7182	-2.0861	5487	33.75	0.38	
J085236.79-010231.3	20230004340	133.1529	-1.0430	7595	34.27	0.38	
J085708.29-005828.5	20230004392	134.2865	-0.9758	3069	32.64	0.40	
J090739.12-005354.1	20230004446	136.9092	-0.9021	9393	35.56	0.38	
J091900.78-004916.6	20230004517	139.7657	-0.8177	5298	35.05	0.43	
J091916.00-015410.2	20230003753	139.8219	-1.9067	7939	34.69	0.41	
J093530.79-004448.0	20230004590	143.8778	-0.7443	5139	33.47	0.39	
J093846.89-011444.7	20230004208	144.6989	-1.2511	4176	33.98	0.42	
J094216.58-020009.9	20230003678	145.5778	-1.9996	5147	34.98	0.39	9a
J094303.88-012127.1	20230004170	145.7672	-1.3620	2187	32.17	0.43	
J094549.96+300657.4	20230060613	146.4532	30.1026	9898	35.46	0.40	
J095757.14-012456.0	20230004153	149.4913	-1.4181	12033	35.48	0.40	
J095800.12-002456.5	20230004829	149.5048	-0.4249	5761	35.04	0.41	
J095825.98-030507.9	20230002829	149.6172	-3.0796	14824	35.42	0.43	
J095905.99-015108.4	20230003795	149.7740	-1.8492	4253	33.48	0.40	
J100643.02-022953.8	20230003257	151.6871	-2.4903	6127	34.83	0.42	
J100900.93-020540.4	20230003598	152.2545	-2.1030	10908	35.79	0.40	
J101441.28-020852.5	20230003556	153.6740	-2.1433	14186	36.52	0.40	
J101905.54+301503.0	20230060717	154.7855	30.2570	11375	36.05	0.39	
J102513.66-013316.4	20230004038	156.3108	-1.5523	7474	35.58	0.39	
J102636.91-030349.4	20230002842	156.6513	-3.0671	10377	37.07	0.39	
J103022.14-032227.2	20230002546	157.5969	-3.3769	6593	34.09	0.46	
J103134.19-004347.9	20230004610	157.8990	-0.7245	9018	35.16	0.43	10
J104006.54-023847.3	20230003137	160.0345	-2.6511	6795	35.96	0.41	
J104342.01-005955.0	20230004376	160.8993	-0.9571	6360	33.60	0.40	*
J104427.24-013718.4	20230003993	161.1207	-1.6156	11706	35.29	0.46	
J104458.43-005601.5	20230004424	161.2472	-0.9352	6359	34.36	0.40	
J104926.62-024202.1	20230003096	162.3537	-2.7133	11331	36.89	0.41	
J105825.23-025242.3	20230002997	164.6066	-2.8891	6122	33.37	0.44	
J110458.76+302112.1	20230060785	166.2428	30.3560	10466	36.72	0.43	

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J110618.59-001331.8	20230004939	166.5848	-0.2252	11736	36.54	0.40	
J110741.32-024724.0	20230053114	166.9256	-2.7927	7655	36.03	0.38	
J111357.22-004830.1	20230004527	168.4939	-0.8102	5659	34.00	0.39	
J112832.70-060920.3	20230000830	172.1458	-6.1460	5373	34.40	0.40	
J113143.08-032816.1	20230002459	172.9337	-3.4716	3312	34.09	0.42	
J113214.82-043142.2	20230001562	173.0730	-4.5410	11341	37.22	0.39	
J113240.54-053905.8	20230050690	173.1844	-5.6553	14677	35.67	0.39	
J113359.66-045334.9	20230050689	173.5031	-4.9081	14597	35.36	0.41	
J113800.26+303801.5	20230006542	174.5231	30.6416	8632	36.15	0.42	
J113950.40-021516.5	20230003441	174.9654	-2.2541	2201	31.94	0.46	
J114900.37-005259.7	20230004460	177.2557	-0.8884	6308	35.70	0.40	
J115557.16-033326.8	20230002392	178.9945	-3.5623	2825	31.27	0.42	b
J120000.87-005856.4	20230004387	180.0020	-1.0279	1787	29.44	0.37	*
J122718.25-020143.4	20230003660	186.8100	-2.0372	2623	30.77	0.39	11
J123612.42-010104.7	20230004362	189.0554	-1.0268	2872	32.45	0.40	
J123636.75+300710.6	20230006219	189.1548	30.1247	4878	33.97	0.45	
J123952.06-002756.3	20230004795	189.9790	-0.4779	4068	31.64	0.41	
J124015.97-052006.8	20230051808	190.0697	-5.3327	6621	34.29	0.41	
J124628.30-043937.5	20230001445	191.6230	-4.6660	3364	33.09	0.43	
J124650.13-022929.8	20230003269	191.7063	-2.5006	4857	34.86	0.41	
J124650.51-060544.5	20230060006	191.7209	-6.1160	4128	33.07	0.42	
J124722.89-052050.0	20230051828	191.8486	-5.3558	5093	34.09	0.39	
J132910.86-021835.0	20230003400	202.3222	-2.3492	4009	35.08	0.39	*
J134034.47-031159.2	20230002731	205.1391	-3.1950	11420	34.61	0.43	
J135725.98-052246.2	20230053464	209.3548	-5.3713	11227	35.50	0.42	
J135800.63-032542.1	20230002498	209.5098	-3.4284	8073	32.64	0.41	b
J135841.23-053511.9	20230053470	209.6797	-5.5878	8017	35.63	0.38	
J135942.88-003118.8	20230004759	209.9316	-0.5257	4530	32.52	0.41	
J143025.78-051038.2	20230050021	217.5980	-5.1819	23009	36.39	0.41	
J143139.97-013451.6	20230004026	217.9192	-1.5783	4108	35.16	0.41	b
J143603.21-025319.2	20230002975	219.0121	-2.8814	13139	36.20	0.41	
J144022.79-050628.6	20230053299	220.0758	-5.1194	7185	34.48	0.40	
J144231.82-050640.0	20230053290	220.6337	-5.1123	7407	34.89	0.38	
J144232.27-042832.9	20230051932	220.6393	-4.4765	5611	34.53	0.40	b
J145141.21-060154.3	20230060031	222.9133	-6.0325	4985	34.34	0.39	
J145331.04-025707.8	20230002927	223.3834	-2.9450	10576	35.87	0.39	
J145907.53-023410.4	20230003188	224.7881	-2.5641	2180	32.34	0.40	
J150631.68-030515.3	20230002827	226.6282	-3.1018	12553	35.28	0.42	
J153539.59-002652.6	20230051631	233.9201	-0.4469	3108	32.00	0.38	
J154137.00-014217.4	20230003931	235.4121	-1.7099	9837	35.38	0.42	
J154708.05-003037.4	20230051633	236.7872	-0.5103	5550	34.38	0.40	b
J155543.22-014711.4	20230003860	238.9180	-1.8062	5003	34.69	0.38	
J160717.43-015123.9	20230003786	241.8267	-1.8599	10889	35.00	0.40	b
J160824.58-025824.1	20230002913	242.1082	-2.9713	9635	33.50	0.42	

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J161550.71-033511.2	20230053251	243.9724	-3.6075	12475	36.67	0.38	
J161726.88-011516.6	20230053126	244.3797	-1.2593	11212	35.78	0.40	
J162544.63-041427.1	20230053253	246.4338	-4.2478	12432	36.10	0.42	
J163101.65-042721.7	20230001617	247.7593	-4.4586	5394	34.59	0.36	
J163930.36-053503.5	20230053239	249.9117	-5.5765	7908	35.77	0.36	*
J165145.54-053854.2	20230050020	252.9454	-5.6281	19306	34.93	0.40	
J165355.48-043439.3	20230001511	253.4344	-4.5854	6899	36.80	0.38	*
J165922.73-053300.4	20230053360	254.8403	-5.5586	9067	37.17	0.36	
J170117.67-045638.9	20230053359	255.3251	-4.9560	9245	35.98	0.37	
J171713.89-005906.2	20230004385	259.3232	-0.9878	11783	36.22	0.37	
J220249.08-015012.5	20230060370	330.7113	-1.8330	7527	34.48	0.39	
J220826.77-015355.2	20230060357	332.1070	-1.9024	9813	36.43	0.41	
J221259.71-052142.4	20230060173	333.2563	-5.3706	7560	34.88	0.40	
J223541.35-014957.0	20230060372	338.9373	-1.8180	16602	36.18	0.45	
J225311.07-013809.4	20230003980	343.2939	-1.6374	4770	32.69	0.43	
J225633.41-011910.5	20230004182	344.1484	-1.3219	3273	32.71	0.39	
J225730.11-012051.9	20230004174	344.3755	-1.3462	13356	36.27	0.39	
J225824.40-013713.4	20230003995	344.6064	-1.6182	4554	32.94	0.44	*
J225913.77-050045.5	20230001146	344.8070	-5.0224	2500	31.30	0.39	
J231307.47-013502.2	20230004025	348.2567	-1.6041	7425	34.20	0.45	
J231352.46-052153.9	20230060170	348.4762	-5.3745	3294	31.11	0.42	
J231723.09-045723.5	20230001182	349.3471	-4.9659	6199	32.69	0.40	
J232017.19-012252.3	20230004161	350.0699	-1.3800	7593	35.89	0.38	
J232301.67-014455.7	20230003894	350.7642	-1.7462	4869	33.88	0.38	
J234107.93-020634.7	20230060306	355.2892	-2.1097	5431	32.66	0.41	
J234117.44-011809.5	20230051732	355.3283	-1.3065	6285	33.65	0.41	
J234300.79-043113.0	20230001571	355.7618	-4.5249	5818	34.32	0.38	
J234804.26-013127.8	20230004060	357.0229	-1.5176	20438	36.30	0.40	
J234820.82-014313.0	20230003914	357.1053	-1.7336	10907	34.99	0.41	
J235531.38-012306.7	20230051733	358.8847	-1.3906	6298	33.78	0.42	

Asterisks denote association with 2 arcmin separation.
a denotes redshift discrepant with NED.
b denotes GALEX source.

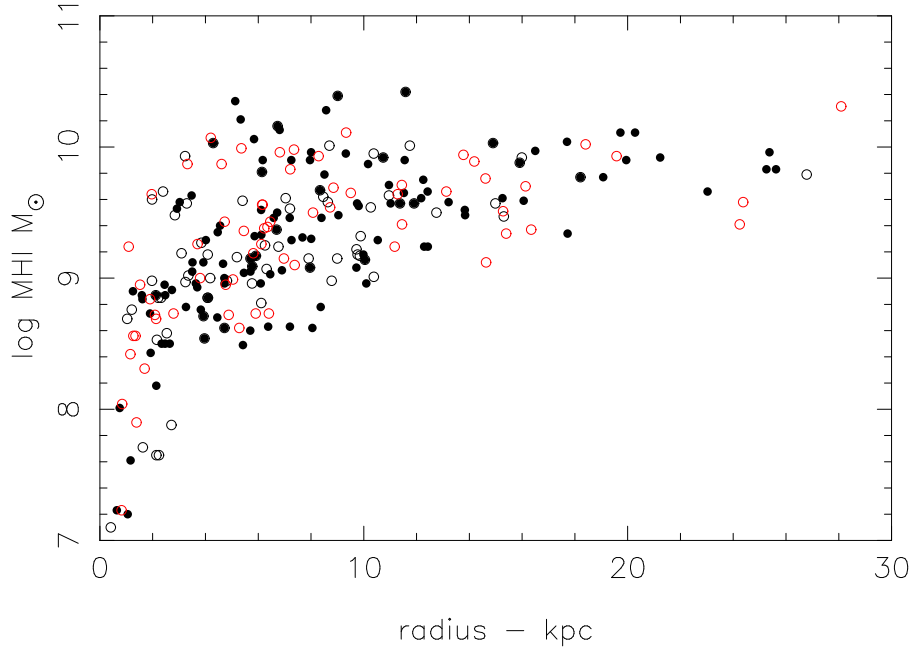|		
1a MCG -01-01-017	2 MCG +00-02-077	3a MCG -01-05-009
4 Mk 1017	5a MCG -01-06-048	6 CGCG 393-023
7 UGC 3113	8 MCG -01-14-004	9a CGCG 007-021
10 2dFGRS	11 CGCG 014-043	

Figure 8: Mass-radius relation for FAST sources identified with DELVE DR2 galaxies, whose catalogue gives major axis radii in arcsec. The solid symbols use a marching radius of 0.18 arcmin, the open symbols use 0.24 arcmin and 0.27 arcmin for the black and red colours respectively. There is a well defined envelope for these objects without the larger radii occupying a wider area.

4   Identifications from DELVE DR2 alone

In the previous sections we have used the positional information from identifications made by Zhang et al. to cross match with optically catalogued galaxies. We now attempt to match some of the non-SGA and non-SDSS FAST 2023 sources with DELVE DR2 galaxies. We tested acceptable radii of 0.18 arcmin (black points in Figure 8), 0.24 arcmin (black open circles) and 0.27 arcmin (red open circles). In this mass-radius relation there is a tendency for spurious objects to fall below the lower envelope of the real ones. None of the chosen radii seem to fail this condition, however.

Figure 9 is the resulting i band TFR. The same symbols are used as in Figure 8, with the addition that green points are multiple matches (expected as the matching circle is increased) resolved through their location in the TFR, and blue ones that are rejected by that criterion. The green line is imported from the SDSS TFR. The vertical scatter of the three matching circles is 1.55 mag for the 123 0.18 arcmin objects, 1.82 for the 78 0.24 arcmin objects and 2.11 mag for the 119 0.27 arcmin red open circles. DELVE positions for these objects are given in Table 2, together with the FAST redshifts.
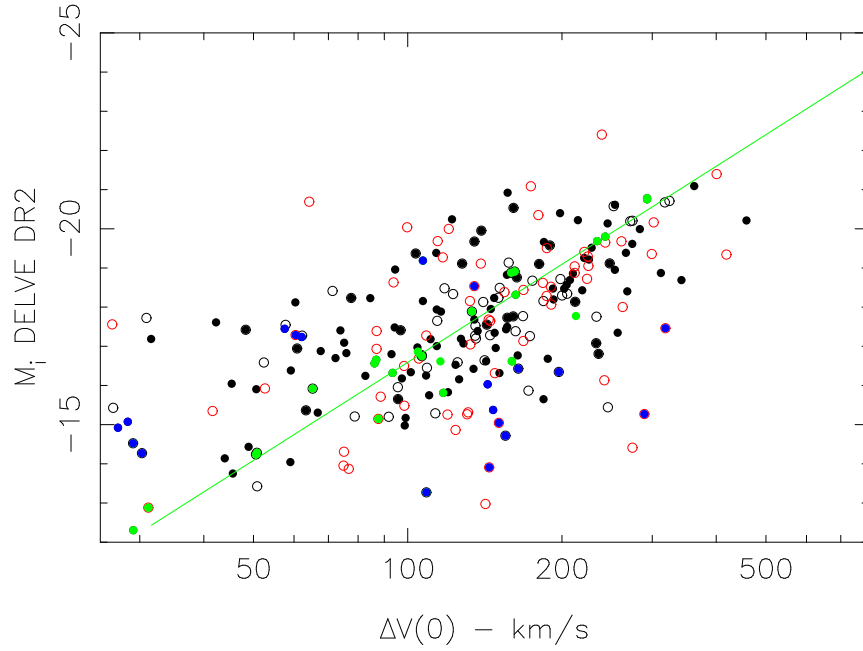
18

Figure 9: The i band TFR for the galaxies in Figure 8. The same black and red symbols are used for the different matching radii. Green points are multiple DELVE galaxies associated with a single FAST source. The blue points are additional multiples that have been rejected on the basis of deviation from the TFR. The red symbols show more scatter than the green or black ones. The green line is the TFR from Figure 6.
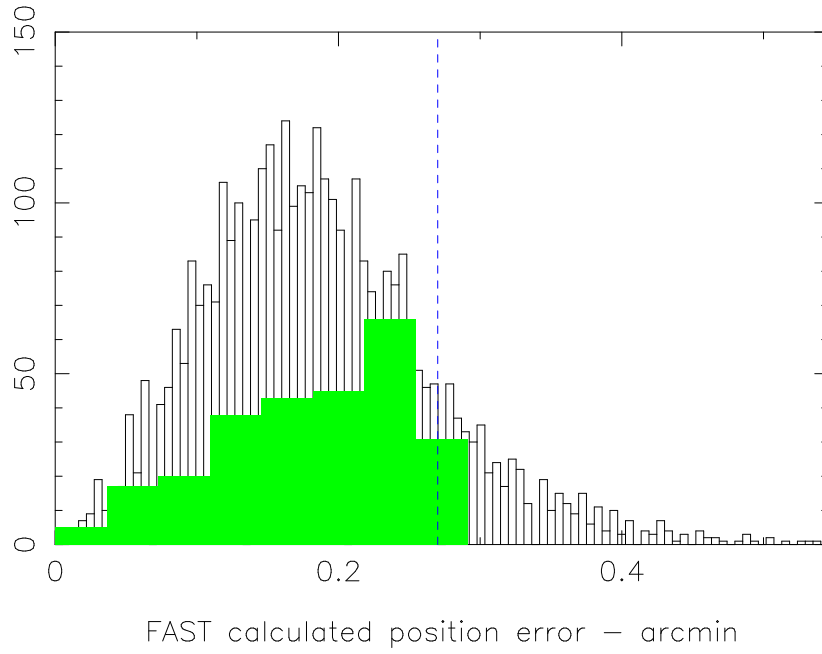
19

Figure 10: The fine histogram is the distribution of individual FAST sources' positional uncertainties, calculated from centroiding the signal. The green coarse histogram is the distribution of DELVE DR2 minus FAST positional differences in arcmin. Our adopted cutoff is the blue dashed vertical line.
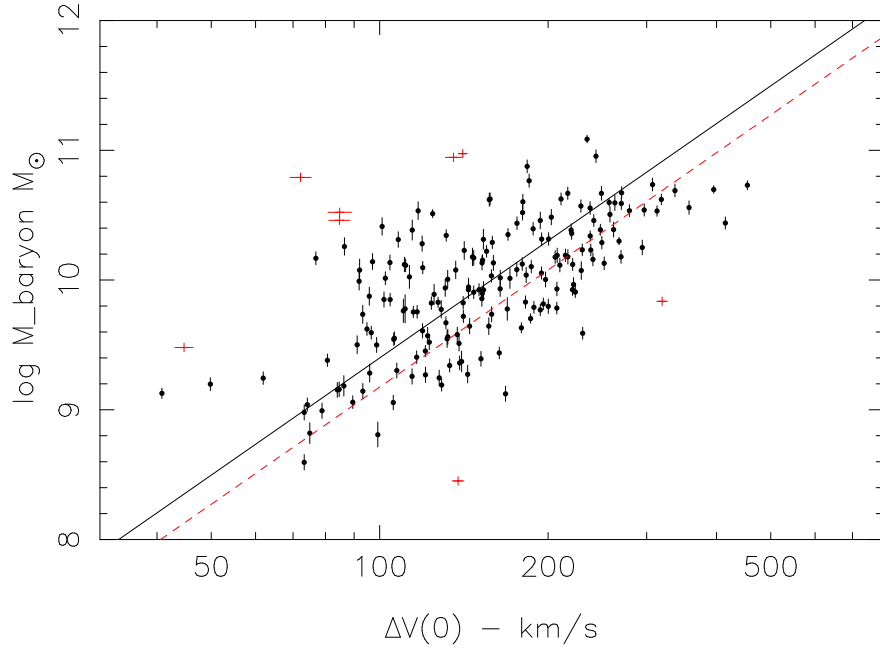
Figure 11: The baryonic TFR for galaxies with DELVE DR2 galaxies matching FAST sources on the basis of position, and not found in SDSS or the Siena Galaxy Atlas. The lines are carried over from Figure 7.

Figure 10 is the stated positional error distribution from the FAST unidentified objects (the open histogram) compared with the actual position differences for the accepted objects (the green filled histogram– which cuts off at 0.27 arcmin). A lot of objects would be lost from FAST positional errors alone if one adopted a really small matching radius. Figure 11 is the baryonic TFR using the normalisations of HI mass and stellar mass of the previous sections.

Table 2: FAST galaxies with DELVE DR2 positions

FAST ID	FAST #	RA (2000)	Dec	v_{CMB}	m-M	±
		deg	deg	km/s	mag	mag
(1)	(2)	(3)	(4)	(5)	(6)	(7)
J003106.65-030429.0	20230002834	7.7781	-3.0718	15065	36.27	0.40
J003428.75-021337.1	20230003461	8.6222	-2.2267	5082	32.46	0.39
J013547.69-031319.2	20230053401	23.9520	-3.2192	8642	34.98	0.44
J015641.23-042037.7	20230001743	29.1741	-4.3469	4214	34.09	0.38
J015806.58-025847.5	20230053048	29.5308	-2.9815	11686	36.94	0.37
J020238.58-004702.3	20230004542	30.6610	-0.7869	9812	34.34	0.45
J021523.10-040218.8	20230001921	33.8465	-4.0393	3842	31.97	0.39
J024806.47-050550.5	20230053287	42.0282	-5.0932	10887	35.76	0.38
J025314.37-000641.6	20230004983	43.3097	-0.1079	12676	35.42	0.40
J030512.31-051120.7	20230053283	46.2998	-5.1921	9119	33.64	0.42
J030624.07-050030.0	20230001152	46.6014	-5.0107	4145	33.17	0.42
J030734.97-020235.2	20230003645	46.8996	-2.0450	12633	36.99	0.37
J030940.60-023046.9	20230003246	47.4162	-2.5206	2916	33.47	0.41*
J031332.47-015044.9	20230003800	48.3833	-1.8478	8307	33.91	0.42
J032855.03-030131.4	20230002872	52.2298	-3.0262	11037	33.91	0.45
J033800.36-033845.9	20230053388	54.5011	-3.6454	10975	35.68	0.45
J035301.35-001907.0	20230060412	58.2535	-0.3201	7388	36.22	0.36
J035439.44-015652.1	20230003720	58.6662	-1.9476	3653	33.50	0.40
J035834.53-013615.3	20230004004	59.6475	-1.6061	3670	33.69	0.37
J035918.96-021018.6	20230003522	59.8291	-2.1692	4445	32.73	0.42
J040035.24-021843.4	20230003394	60.1493	-2.3109	11677	35.44	0.48
J040255.33-030833.9	20230002775	60.7336	-3.1435	8001	33.80	0.44
J040622.36-013658.1	20230003998	61.5913	-1.6142	7087	33.99	0.45
J040640.86-034625.6	20230042125	61.6694	-3.7779	11590	36.13	0.39
J042813.01-045301.8	20230001239	67.0519	-4.8876	4906	34.62	0.38
J042950.73-032226.9	20230002547	67.4581	-3.3768	13033	38.42	0.38
J043836.69-010836.2	20230060405	69.6530	-1.1463	3438	33.60	0.40
J044423.64-034508.0	20230060247	71.0949	-3.7544	9059	36.13	0.38
J044441.17-031839.1	20230002593	71.1747	-3.3126	3202	33.51	0.38
J050222.44-013108.1	20230004069	75.5974	-1.5176	6851	34.75	0.40
J050302.33-023437.9	20230003179	75.7576	-2.5787	4175	32.44	0.39
J050339.66-012115.4	20230060385	75.9178	-1.3572	4321	32.75	0.41
J050410.32-055602.0	20230060053	76.0467	-5.9335	3926	32.69	0.42
J051047.31-024051.7	20230003112	77.6996	-2.6847	2825	31.32	0.37
J051411.62-030953.0	20230002759	78.5522	-3.1663	3971	33.99	0.39
J054726.47-024821.4	20230003040	86.8614	-2.8100	5781	33.93	0.36
J060558.75-022957.4	20230003261	91.4948	-2.5010	2566	31.24	0.42
J060950.42-021603.4	20230003429	92.4643	-2.2678	5679	34.26	0.37
J061008.26-025534.6	20230060284	92.5332	-2.9305	21035	35.17	0.42

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Table 2 – *Continued*

J071018.27+295554.1	20230060446	107.5726	29.9310	5047	34.38	0.38
J075145.03-034619.3	20230050717	117.9359	-3.7696	16651	38.23	0.39
J075213.44-053058.1	20230050713	118.0560	-5.5140	16520	35.87	0.40
J075218.52-043010.7	20230053231	118.0753	-4.5006	12164	35.28	0.42
J075842.12-060322.0	20230000874	119.6743	-6.0601	26344	36.54	0.37
J075932.51-034143.1	20230002229	119.8840	-3.6947	17615	37.84	0.38
J080755.46-050452.0	20230001091	121.9829	-5.0819	11479	36.50	0.38
J081821.27-055215.2	20230000928	124.5954	-5.8719	5414	33.75	0.47
J082107.91-031827.2	20230002594	125.2832	-3.3096	13204	34.72	0.38
J083741.34-053839.3	20230001014	129.4254	-5.6456	5134	34.93	0.48
J083836.89-053927.7	20230001009	129.6573	-5.6600	9789	35.77	0.39
J085559.41-013921.9	20230003960	134.0009	-1.6577	1814	31.22	0.39
J090635.14-042253.1	20230001684	136.6445	-4.3782	2225	31.11	0.43
J091152.93-033059.6	20230002420	137.9688	-3.5188	5418	34.12	0.43
J092951.09-034433.1	20230002194	142.4662	-3.7444	7087	33.05	0.43
J094824.18-035213.9	20230002065	147.1011	-3.8714	4267	32.53	0.39
J095919.70+301046.0	20230058057	149.8328	30.1785	14174	35.87	0.39
J110311.46+303659.1	20230053646	165.7970	30.6204	10197	36.67	0.39
J102906.05-050521.2	20230053217	157.2752	-5.0892	8921	34.60	0.43
J111549.78+301940.4	20230065275	168.9571	30.3283	7990	35.71	0.40
J111725.13-052750.5	20230053424	169.3567	-5.4626	11778	35.66	0.40
J112205.16+301207.7	20230060684	170.5215	30.2038	7307	34.71	0.40
J103325.28-055750.9	20230000898	158.3553	-5.9641	8870	34.73	0.43
J113359.66-045334.9	20230050689	173.5031	-4.9081	14597	35.36	0.41
J114257.38-054453.7	20230053505	175.7410	-5.7441	10069	34.25	0.45
J115925.46+301244.9	20230060693	179.8569	30.2145	3691	33.61	0.40
J120105.33-004755.6	20230004534	180.2696	-0.7875	6759	34.40	0.40
J122801.74-051842.8	20230051944	187.0070	-5.3146	5116	34.06	0.40
J123816.34-003333.4	20230004730	189.5710	-0.5602	7568	34.10	0.46
J124839.36-034125.9	20230042126	192.1687	-3.6920	3073	33.31	0.44
J125209.28-055339.5	20230060063	193.0431	-5.8936	4424	33.49	0.41
J130034.49-055648.1	20230060051	195.1461	-5.9455	4295	33.40	0.40
J130118.14-055654.7	20230060049	195.3297	-5.9489	4154	33.13	0.38
J134118.49-055921.3	20230060038	205.3271	-5.9878	7081	35.23	0.38
J134346.76-020412.9	20230003623	205.9484	-2.0708	7091	35.25	0.43
J134954.67-020045.3	20230003674	207.4814	-2.0143	7222	33.08	0.42
J140856.45-034955.2	20230051926	212.2362	-3.8344	3625	32.80	0.42
J140959.44-050714.1	20230051920	212.4995	-5.1196	2822	32.65	0.42
J141346.25-051831.2	20230060182	213.4459	-5.3055	10130	36.01	0.39
J141454.28-020836.1	20230003550	213.7253	-2.1393	1805	31.20	0.43
J142014.14-033416.6	20230002382	215.0596	-3.5704	14927	34.24	0.45
J142118.76-052747.6	20230053305	215.3288	-5.4629	7362	34.30	0.41
J145242.37-044600.2	20230001316	223.1807	-4.7671	8094	35.04	0.43
J150117.31-034126.2	20230060251	225.3218	-3.6871	10306	34.99	0.44

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Table 2 – *Continued*

J150517.41-053146.8	20230053293	226.3242	-5.5280	10756	36.01	0.38
J151100.65-053936.3	20230053294	227.7528	-5.6580	10813	36.12	0.39
J151539.81-025012.5	20230003018	228.9172	-2.8391	2111	32.94	0.38
J152128.99-011611.4	20230053139	230.3799	-1.2692	11278	36.88	0.42
J152906.72-034641.0	20230002143	232.2785	-3.7768	9966	34.08	0.39
J152922.67-053153.6	20230053348	232.3472	-5.5349	11260	36.25	0.41
J153053.46-045312.9	20230001235	232.7199	-4.8869	8360	34.53	0.42
J153123.83-034138.4	20230002230	232.8513	-3.6938	10468	35.48	0.38
J153230.41-033628.7	20230002332	233.1255	-3.6104	7171	33.90	0.39
J153623.64-052708.2	20230053331	234.1003	-5.4557	8313	35.61	0.39
J153802.51-011003.5	20230051632	234.5144	-1.1647	3488	32.92	0.43
J154104.13-040656.4	20230001870	235.2714	-4.1168	8425	35.20	0.38
J154945.92-031651.3	20230050665	237.4391	-3.2816	15664	35.44	0.41
J155006.41-015904.3	20230003695	237.5284	-1.9875	9135	34.58	0.43
J155522.34-053413.6	20230053341	238.8459	-5.5732	9238	36.04	0.37
J160041.54-040438.8	20230001895	240.1708	-4.0773	15619	37.01	0.40
J160052.26-021914.9	20230003390	240.2195	-2.3229	15470	35.24	0.41
J160848.77-033829.4	20230053245	242.2076	-3.6421	9449	36.62	0.36
J162310.94-033934.5	20230002270	245.7940	-3.6612	16396	35.96	0.38
J164941.52-031901.8	20230053368	252.4248	-3.3195	6937	33.70	0.39
J170248.68-034614.0	20230002160	255.7036	-3.7687	5128	34.89	0.39
J171358.51-034941.6	20230053355	258.4951	-3.8280	7420	32.56	0.36

*Initially the algorithm found the wrong galaxy from a group of 3

5 Identifications from Legacy Survey Tractor North

The Legacy Survey [2] as part of DR9 has provided Tractor photometry of northern fields, and we have matched these with FAST sources in the same way as for the DELVE survey. We included every object with $z < 22$ and half light radius greater than 3". The mass radius relations looks the same as for the DELVE identifications, with the same independence on matching radius out to 2.7 arcmin. Figure 12 shows the z band TFR with the same colour coding as Figure 3. With such a faint limit on the photometry there are many multiple matches, and these were resolved by choosing the match that gave the closest fit to the TFR. Rejects are shown as blue crosses. We chose the zeropoint of the Tractor photometry to match that of the SGA photometry. With over 2000 galaxies this was achieved to an accuracy of 0.005 mag.

Figure 13 is the baryonic TFR and Table 3 gives the Legacy Survey positions and TFR distance moduli for these galaxies. Named galaxies are listed in the notes to that table.

One interesting feature of the Legacy Survey tractor photometry is the provision of ellipticity uncertainties. This catalogue includes ϵ_1 and ϵ_2 for gravita-
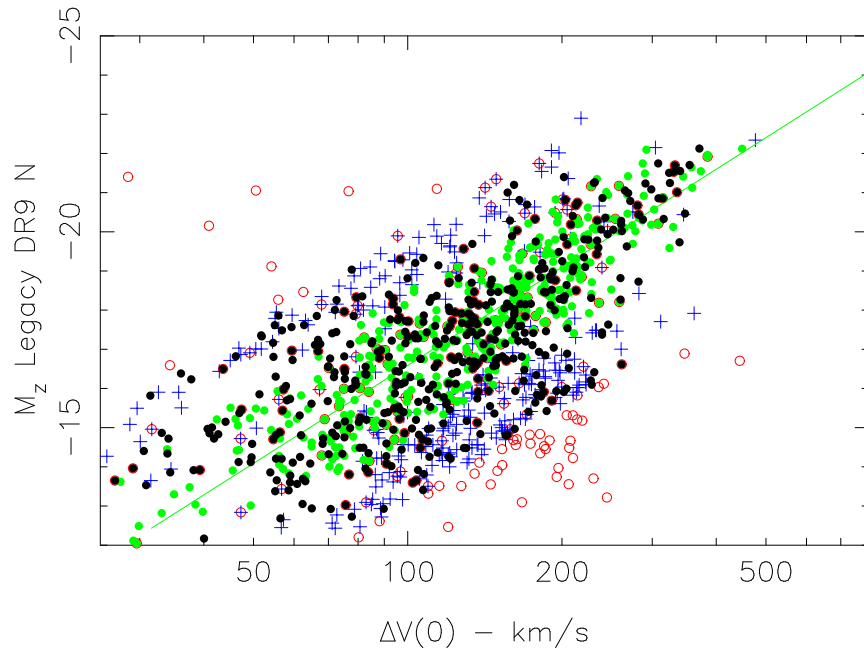
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[2] www.legacysurvey.org

Figure 12: TFR in z band for northern FAST galaxies. Green points are multiple identifications; blue crosses are rejected multiples or galaxies which deviate from the TFR by more than 2.5σ. Red open circles are identifications 2.4–2.7 arcmin from the FAST position.
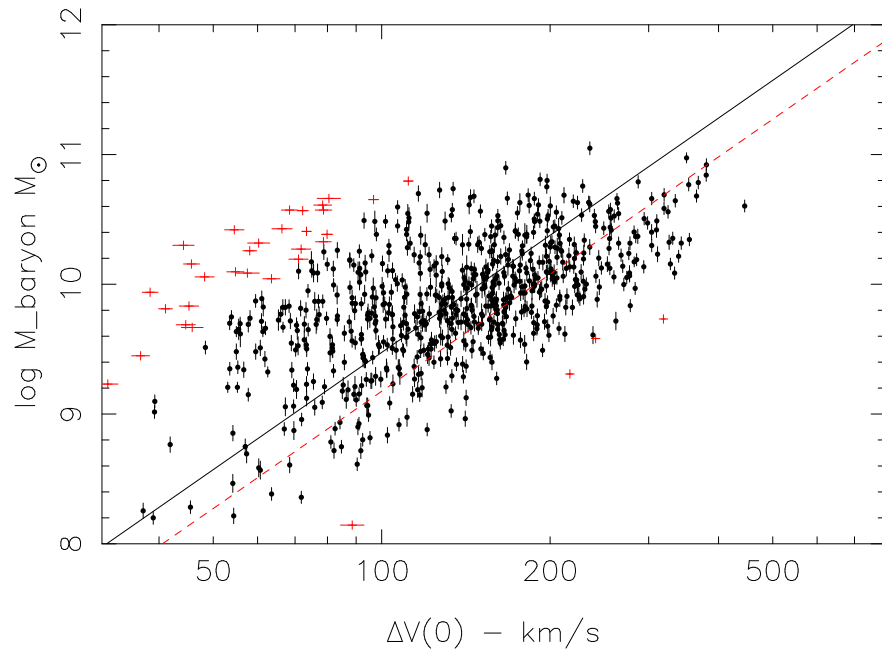
Figure 13: Baryonic TFR for northern FAST galaxies with z band photometry. Error bars are from the FAST data only, as uncertainties are not provided for the Tractor photometry. The red crosses are 2.5σ deviates from the black fitted line. The dashed red line is the calibration relation.
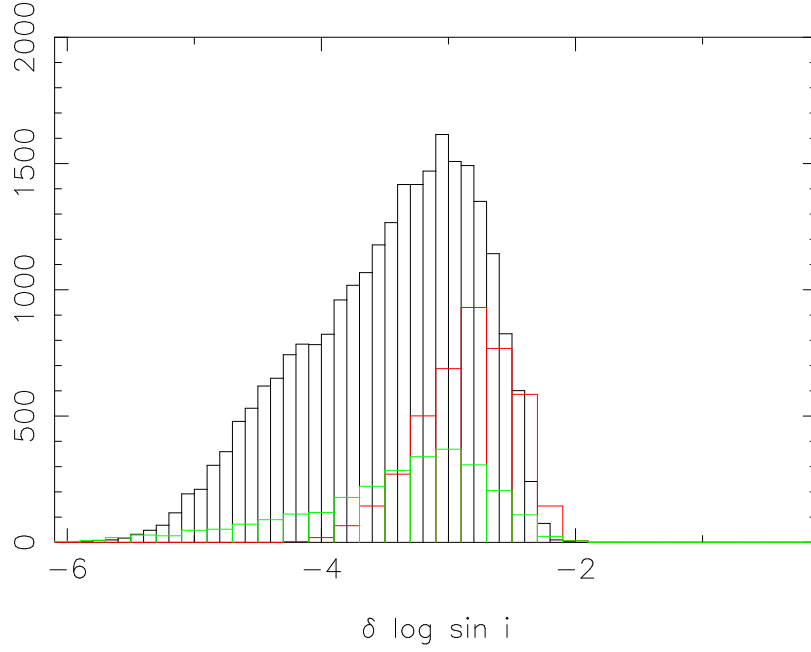
Figure 14: Logarithmic fractional uncertainties in sin i for faint, inclined galaxies in part of the Legacy Survey Tractor North catalogue. The black histogram is for galaxies with $z > 21$, red for $z < 21$ mag, and green for half light radius > 9".

tional microlensing analysis where $\epsilon = \sqrt{(\epsilon_1^2 + \epsilon_2^2)}$ and

$$b/a = \frac{1-\epsilon}{1+\epsilon}$$

. From this we obtain by differentiating the the equation for $\cos i$

$$\frac{\delta \sin i}{\sin i} = \frac{(1-\epsilon)^2}{4\ ln(10)\epsilon(1+\epsilon)}(\epsilon_1\delta\epsilon_1 + \epsilon_2\delta\epsilon_2)$$

. For galaxies with $0.2 < b/a < 0.7$, $z < 22$ and half light radius exceeding 3" we obtain Figure 14. Clearly all but a few galaxies have log $\Delta V(0)$ uncertainties from this cause of 0.01 dex, and the modal uncertainty is in the third decimal place.

Table 3: Legacy Survey identified FAST galaxies and positions

FAST ID	FAST #	RA (2000)	Dec	v_{CMB}	m-M	±	Note	
		deg	deg	km/s	mag	mag		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
J061719.63+495533.0	20230031663	94.3351	49.9249	10931	37.01	0.41		
J061908.04+484424.2	20230056174	94.7840	48.7431	9075	36.46	0.38		
J062136.99+483336.1	20230056218	95.4040	48.5596	12173	36.56	0.42		
J062252.89+493921.5	20230031423	95.7225	49.6585	5820	32.51	0.41		
J062357.82+462405.4	20230028439	95.9926	46.3976	10648	37.42	0.40		
J062439.08+480731.8	20230030021	96.1592	48.1275	23275	36.60	0.38		
J062700.15+482651.3	20230056195	96.7502	48.4458	11205	37.91	0.38		
J063226.75+390318.4	20230018273	98.1157	39.0570	5382	34.05	0.39		
J063238.80+472226.0	20230029381	98.1656	47.3759	17345	36.33	0.43		
J063310.76+382914.2	20230017415	98.2913	38.4875	6999	34.10	0.41		
J063325.38+481012.6	20230056212	98.3543	48.1711	11940	37.64	0.39		
J063503.05+502632.0	20230032050	98.7682	50.4410	11436	36.19	0.37		
J063631.63+492205.2	20230031154	99.1332	49.3697	5833	34.71	0.38		
J063632.90+505234.8	20230032413	99.1417	50.8737	10942	35.69	0.40		
J063857.15+483708.8	20230030506	99.7397	48.6216	6014	33.30	0.39		
J064051.33+342229.8	20230011468	100.2124	34.3764	5244	34.87	0.38		
J064057.72+374753.0	20230042290	100.2399	37.7941	12765	34.37	0.43		
J064310.22+501846.8	20230031957	100.7978	50.3100	14619	35.43	0.39		
J064337.44+401624.2	20230020317	100.9068	40.2711	6372	34.85	0.38		
J064342.09+430439.8	20230024718	100.9296	43.0747	6232	34.93	0.38		
J064346.98+350931.9	20230012050	100.9481	35.1550	13835	37.71	0.40		
J064347.79+375701.9	20230016580	100.9470	37.9527	13058	36.68	0.40		
J064355.82+503701.8	20230032200	100.9876	50.6163	13050	36.04	0.44		
J064409.16+340915.3	20230011260	101.0369	34.1528	13235	36.78	0.38		
J064418.69+410446.5	20230021738	101.0822	41.0775	14429	37.49	0.38		
J064439.19+385330.7	20230017990	101.1666	38.8921	7338	34.57	0.44		
J064525.79+483207.5	20230030432	101.3581	48.5310	6016	34.87	0.38		
J064545.12+380658.5	20230016829	101.4388	38.1197	7430	35.12	0.40		
J064600.23+353615.8	20230012581	101.4976	35.6034	13308	35.81	0.39		
J064730.76+491454.1	20230056248	101.8743	49.2453	11853	36.12	0.48		
J064739.50+355155.4	20230013031	101.9169	35.8643	11562	36.23	0.45		
J064847.66+454524.8	20230027641	102.1961	45.7567	6457	34.72	0.43		
J064911.00+503145.6	20230056244	102.2994	50.5319	11447	36.70	0.40		
J064912.55+424850.3	20230024337	102.3010	42.8171	6478	34.59	0.39		
J064922.08+342944.9	20230050801	102.3431	34.4952	13515	36.84	0.40		
J065038.01+395210.5	20230019737	102.6639	39.8706	5213	33.50	0.37		
J065043.88+453211.2	20230027350	102.6839	45.5323	6366	35.44	0.39		
J065147.51+490157.9	20230030854	102.9483	49.0319	15328	37.27	0.38		
J065158.44+502346.7	20230032007	102.9951	50.3983	5680	35.30	0.36		13

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Table 3 – *Continued*

J065220.28+494122.7	20230031450	103.0804	49.6913	11982	37.20	0.38	12
J065424.63+343054.9	20230011579	103.6039	34.5140	2820	30.41	0.44	
J065438.58+371812.5	20230015585	103.6624	37.3005	12928	35.63	0.41	
J065524.17+470025.3	20230029061	103.8533	47.0087	15715	34.99	0.41	
J065528.10+384344.8	20230017788	103.8686	38.7253	5194	34.52	0.38	
J065615.32+392643.8	20230018961	104.0661	39.4459	13841	36.54	0.38	
J065620.86+403816.9	20230020938	104.0851	40.6341	18782	38.10	0.39	
J065855.20+482649.5	20230051514	104.7268	48.4511	15375	38.35	0.38	
J065856.05+323634.1	20230009150	104.7301	32.6068	8530	36.43	0.39	
J065900.15+410713.6	20230055336	104.7449	41.1207	13013	34.68	0.43	
J065909.23+454130.0	20230027549	104.7853	45.6924	14084	35.36	0.38	27
J065952.23+433607.7	20230025298	104.9727	43.6008	11487	36.62	0.40	
J070021.89+403855.3	20230020962	105.0924	40.6495	6315	33.93	0.39	
J070145.35+505124.5	20230032388	105.4336	50.8565	16668	36.54	0.39	
J070213.85+331004.7	20230009966	105.5574	33.1707	6198	33.19	0.43	
J070251.10+350615.2	20230012017	105.7176	35.1056	12255	37.62	0.39	
J070251.88+341933.5	20230011397	105.7141	34.3221	4999	34.28	0.38	
J070257.56+415433.9	20230022788	105.7417	41.9103	17385	37.62	0.38	
J070338.60+510606.5	20230032587	105.9132	51.0996	1102	29.81	0.41	
J070402.93+381446.0	20230017034	106.0142	38.2462	8290	37.24	0.38	
J070409.82+353924.3	20230012651	106.0429	35.6574	5272	33.95	0.39	
J070418.67+444714.9	20230026620	106.0765	44.7866	13756	36.38	0.42	
J070459.49+482246.9	20230052712	106.2487	48.3803	5586	34.83	0.41	
J070507.47+391002.2	20230018430	106.2834	39.1663	6932	34.78	0.39	
J070526.99+325917.0	20230052192	106.3623	32.9865	5103	34.73	0.40	
J070543.78+384422.7	20230017804	106.4349	38.7416	5103	32.65	0.39	
J070636.75+481305.5	20230056239	106.6490	48.2216	10705	34.86	0.42	
J070649.31+355151.2	20230013030	106.7076	35.8677	5248	35.00	0.40	
J070826.19+463939.9	20230028741	107.1139	46.6602	8053	36.56	0.39	11
J070932.43+425327.6	20230024459	107.3856	42.8905	5780	34.26	0.43	
J071012.42+380230.4	20230016710	107.5534	38.0414	15258	36.64	0.40	
J071017.66+491614.7	20230031078	107.5741	49.2678	5600	34.38	0.38	
J071052.14+323134.6	20230009026	107.7205	32.5273	9113	35.91	0.38	
J071124.63+420130.3	20230022975	107.8509	42.0217	5604	31.90	0.42	
J071242.29+353452.6	20230012541	108.1801	35.5829	7453	34.58	0.39	
J071254.48+431534.6	20230024919	108.2329	43.2585	21665	37.03	0.40	
J071257.26+344338.0	20230050216	108.2363	34.7263	19376	34.55	0.43	
J071333.85+395446.0	20230019797	108.3934	39.9118	15754	37.17	0.38	
J071406.92+451013.0	20230026941	108.5283	45.1702	12947	36.16	0.38	
J071418.23+374110.6	20230016208	108.5759	37.6898	7143	33.84	0.40	
J071509.07+400630.8	20230020109	108.7891	40.1044	12666	37.32	0.38	
J071603.10+455253.7	20230027852	109.0131	45.8847	18813	36.49	0.43	
J071609.40+404310.2	20230021087	109.0389	40.7235	7029	34.51	0.38	
J071627.03+481209.0	20230030095	109.1132	48.2041	12878	35.74	0.39	

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Table 3 – *Continued*

J071646.31+321104.3	20230053714	109.1905	32.1838	7035	34.73	0.43	
J071704.61+433250.5	20230025243	109.2697	43.5471	9330	36.30	0.40	
J071740.74+420045.0	20230022952	109.4171	42.0087	19036	35.28	0.39	
J071818.60+485323.6	20230030746	109.5803	48.8863	14534	34.50	0.39	
J071857.08+483521.3	20230030481	109.7399	48.5896	5794	32.01	0.44	
J071912.08+335253.0	20230010942	109.8035	33.8824	3967	32.48	0.39	
J071943.57+503337.0	20230051494	109.9307	50.5634	16271	35.70	0.43	
J071946.84+382315.1	20230017269	109.9425	38.3909	17092	36.00	0.41	
J072023.44+484203.4	20230030578	110.0961	48.7049	5817	34.26	0.40	
J072039.55+445026.8	20230026671	110.1639	44.8380	9955	34.44	0.44	
J072141.57+390421.4	20230018302	110.4201	39.0726	15722	34.22	0.43	
J072150.37+402418.1	20230020495	110.4594	40.4030	15484	37.46	0.41	
J072154.47+335850.6	20230011103	110.4779	33.9825	10761	36.76	0.40	
J072221.22+480332.4	20230029962	110.5825	48.0594	18898	37.28	0.38	
J072235.20+382100.4	20230017222	110.6517	38.3507	3001	31.88	0.42	
J072243.27+383641.4	20230051064	110.6815	38.6103	16440	38.81	0.37	
J072350.48+390340.4	20230018283	110.9640	39.0589	5278	34.35	0.38	
J072351.25+492413.9	20230031187	110.9609	49.4075	18438	36.54	0.38	
J072352.14+483720.2	20230056371	110.9634	48.6255	12614	37.56	0.38	
J072352.53+331116.9	20230050192	110.9652	33.1890	18530	36.05	0.38	
J072428.20+432133.4	20230025057	111.1160	43.3626	16979	35.87	0.38	
J072512.65+374005.3	20230016182	111.3057	37.6682	3719	32.98	0.38	
J072522.89+485018.4	20230030709	111.3429	48.8344	5848	34.02	0.38	
J072533.54+491006.1	20230031008	111.3911	49.1682	5578	32.92	0.45	
J072550.99+363714.1	20230014343	111.4604	36.6236	4508	33.29	0.37	
J072613.22+400651.6	20230020116	111.5596	40.1168	5668	34.57	0.40	
J072645.39+371758.3	20230015577	111.6901	37.2978	3735	30.96	0.41	
J072832.93+343201.3	20230011593	112.1373	34.5310	23444	37.52	0.43	
J072940.14+502003.4	20230031971	112.4178	50.3338	5821	34.49	0.38	7
J072946.78+464109.5	20230028763	112.4488	46.6886	16370	37.51	0.38	
J072953.71+333421.4	20230010527	112.4743	33.5766	4965	33.14	0.37	
J073027.15+320901.2	20230008465	112.6169	32.1518	4874	32.50	0.41	
J073030.57+492054.7	20230031135	112.6290	49.3510	6185	35.36	0.38	
J073145.82+470856.0	20230029173	112.9446	47.1513	19108	35.33	0.44	
J073358.23+490326.1	20230030882	113.4920	49.0584	3122	32.79	0.38	
J073531.74+340818.5	20230050811	113.8832	34.1382	16687	36.67	0.40	
J073557.67+485619.2	20230030786	113.9870	48.9393	6445	32.56	0.38	5
J073604.02+445148.0	20230026691	114.0127	44.8642	9680	35.54	0.40	
J073613.15+394621.5	20230019613	114.0528	39.7743	18681	34.97	0.42	
J073642.23+420019.6	20230022939	114.1779	42.0066	8584	35.33	0.38	
J073816.29+395258.8	20230019751	114.5705	39.8857	18125	35.24	0.43	
J073957.01+505307.3	20230032429	114.9894	50.8872	11160	35.66	0.38	
J074123.62+330311.2	20230009809	115.3478	33.0523	23139	35.71	0.39	
J074153.55+382957.8	20230042334	115.4783	38.4983	3650	33.11	0.44	

Table 3 – *Continued*

J074246.63+472450.7	20230029419	115.6919	47.4152	9656	35.14	0.38
J074657.35+401059.4	20230020205	116.7413	40.1873	10218	36.03	0.39
J075532.85+502434.9	20230032024	118.8867	50.4136	6690	34.17	0.39
J075533.74+460212.7	20230055914	118.8946	46.0382	11424	36.50	0.43
J075627.66+355437.3	20230013080	119.1119	35.9069	13726	36.45	0.42
J075643.76+502104.4	20230031984	119.1834	50.3542	3589	33.31	0.40
J075855.23+325749.3	20230009688	119.7325	32.9632	13824	36.23	0.41
J075932.70+452331.1	20230027169	119.8877	45.3960	16470	36.03	0.42
J080105.18+471148.5	20230052680	120.2755	47.2004	6731	33.98	0.41
J080441.47+405049.6	20230021395	121.1750	40.8433	7147	34.93	0.40
J080520.12+400504.0	20230020075	121.3348	40.0813	15099	36.38	0.39
J080540.92+395935.2	20230019897	121.4239	39.9899	15162	36.34	0.39
J080544.26+445738.6	20230026782	121.4391	44.9623	6903	33.20	0.42
J080849.65+472030.3	20230029349	122.2030	47.3432	12300	35.79	0.41
J081010.05+470635.6	20230029148	122.5421	47.1107	13496	37.20	0.38
J081020.11+394127.7	20230019433	122.5809	39.6902	6892	34.71	0.39
J081526.81+473936.5	20230029666	123.8633	47.6638	12149	36.27	0.41
J081613.31+394312.3	20230019493	124.0582	39.7224	18791	36.48	0.40
J082050.23+340124.2	20230011148	125.2141	34.0231	6406	35.43	0.39
J082217.93+402036.3	20230020404	125.5730	40.3466	18231	38.06	0.37
J082331.82+503055.1	20230032114	125.8795	50.5140	7373	34.87	0.40
J082400.44+390154.7	20230018225	126.0047	39.0282	8707	34.59	0.42
J082645.36+370931.4	20230015298	126.6877	37.1601	12902	34.37	0.46
J082748.07+384748.9	20230017876	126.9541	38.7995	12329	37.68	0.41
J082801.01+481853.2	20230051416	127.0060	48.3142	14922	36.47	0.43
J084237.31+373553.3	20230016072	130.6587	37.5957	2232	32.23	0.40
J084649.40+450350.0	20230026860	131.7012	45.0638	16625	35.44	0.46
J084953.53+403112.8	20230020739	132.4734	40.5199	10619	34.06	0.43
J085003.36+463951.1	20230028746	132.5178	46.6646	11548	35.11	0.40
J085017.95+315502.4	20230008075	132.5774	31.9176	7812	35.98	0.38
J085041.40+383806.2	20230017640	132.6744	38.6349	7549	34.98	0.42
J085046.76+334807.7	20230010842	132.6915	33.8050	13743	37.00	0.39
J085051.60+334550.0	20230050327	132.7177	33.7628	18448	38.03	0.37
J085623.22+404022.4	20230055111	134.0964	40.6686	8804	36.58	0.42
J090018.28+421507.1	20230062240	135.0782	42.2483	8334	34.72	0.44
J090019.69+370447.8	20230015164	135.0836	37.0774	13179	36.37	0.40
J090532.46+410705.9	20230021794	136.3821	41.1183	8770	34.20	0.42
J090939.82+495946.1	20230031698	137.4170	49.9958	7017	34.88	0.40
J091112.85+404948.4	20230021338	137.8085	40.8294	3483	32.29	0.41
J091308.94+393343.4	20230019195	138.2865	39.5627	7266	34.48	0.39
J091434.06+340533.0	20230011199	138.6419	34.0927	11792	36.55	0.43
J091959.41+443720.1	20230026457	139.9959	44.6229	4409	32.47	0.43
J092246.47+333250.2	20230010478	140.6946	33.5491	7891	34.09	0.43
J092324.15+373332.5	20230054796	140.8481	37.5594	8436	34.55	0.41

Table 3 – *Continued*

J092443.79+404025.2	20230021013	141.1843	40.6762	8511	34.85	0.42	
J093038.10+404219.8	20230055465	142.6632	40.7067	12468	36.11	0.44	
J093229.34+412835.7	20230022250	143.1272	41.4763	4581	33.50	0.40	
J093530.47+353810.1	20230012626	143.8811	35.6353	8404	35.43	0.42	
J093804.79+404345.1	20230021106	144.5173	40.7278	17192	36.97	0.39	
J093949.86+444756.7	20230026635	144.9589	44.8001	7277	34.39	0.40	
J094048.94+390154.4	20230018224	145.2072	39.0296	5878	34.13	0.39	
J094155.85+325626.5	20230009650	145.4876	32.9408	13855	35.41	0.40	
J094227.50+402238.2	20230020453	145.6174	40.3791	8469	36.50	0.40	
J094756.91+361944.1	20230013815	146.9858	36.3304	8227	34.56	0.43	
J095132.77+325215.9	20230009556	147.8864	32.8721	7402	33.96	0.41	
J095855.33+411513.3	20230021990	149.7322	41.2502	13391	35.96	0.39	
J095906.16+502740.2	20230062962	149.7732	50.4620	15475	37.83	0.40	
J095906.26+462652.3	20230028487	149.7744	46.4472	799	29.17	0.44	
J095914.13+320933.1	20230008461	149.8121	32.1582	8085	35.57	0.40	
J100232.14+431122.4	20230024835	150.6331	43.1932	10020	33.73	0.45	
J100434.91+361833.7	20230013781	151.1468	36.3130	1791	31.21	0.42	
J100629.64+370623.8	20230050979	151.6286	37.1081	15967	35.87	0.46	
J100632.18+460527.6	20230028088	151.6356	46.0932	4241	33.97	0.39	
J100704.92+370932.2	20230015361	151.7703	37.1591	10511	35.86	0.39	
J100752.44+464131.1	20230028774	151.9685	46.6901	5041	34.91	0.38	
J100913.70+323655.8	20230058560	152.3120	32.6159	6077	32.97	0.37	20
J101531.93+323012.6	20230008973	153.8818	32.5058	8954	36.04	0.39	19
J101601.96+441029.6	20230026003	154.0051	44.1730	13563	37.28	0.43	
J101728.63+435844.4	20230025751	154.3717	43.9816	5387	34.32	0.41	
J101820.23+402245.7	20230020456	154.5862	40.3830	4799	34.25	0.42	
J102041.04+501041.5	20230051529	155.1732	50.1772	17657	36.42	0.46	
J102059.77+475320.0	20230029829	155.2533	47.8914	15619	37.13	0.39	
J102107.16+391715.5	20230042503	155.2825	39.2904	7274	33.62	0.44	
J102125.25+361215.4	20230013606	155.3551	36.2008	8281	34.74	0.42	
J102129.97+454126.9	20230027547	155.3735	45.6929	26207	37.71	0.40	
J102148.44+371821.0	20230015587	155.4541	37.3028	16283	36.40	0.38	
J102319.06+453522.6	20230027417	155.8306	45.5908	7205	32.57	0.40	
J102424.76+395029.9	20230019707	156.1005	39.8428	16611	38.01	0.39	
J102510.30+430617.6	20230024741	156.2929	43.1014	4415	32.44	0.44	
J102519.63+484809.2	20230030680	156.3358	48.8011	7072	34.07	0.40	
J102552.07+451445.4	20230027042	156.4696	45.2421	13464	35.38	0.43	
J102733.11+370400.6	20230015144	156.8909	37.0670	7978	33.33	0.39	
J102804.79+463335.7	20230028634	157.0190	46.5582	12380	35.16	0.44	
J102902.72+385212.1	20230054999	157.2603	38.8691	8441	34.94	0.43	
J103201.92+321701.0	20230008626	158.0118	32.2830	6883	33.01	0.45	9
J103223.91+370644.5	20230055020	158.1020	37.1158	12067	37.42	0.39	
J103246.30+501755.7	20230031953	158.1873	50.2975	19172	36.06	0.42	
J103442.45+385021.3	20230055001	158.6791	38.8372	9303	35.93	0.43	

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Table 3 – *Continued*

J103455.74+325849.3	20230053638	158.7328	32.9838	8511	36.00	0.42	
J103639.08+411222.8	20230021958	159.1660	41.2062	7156	34.80	0.39	
J103703.94+404425.5	20230021129	159.2680	40.7436	9220	35.64	0.40	
J103908.92+323804.9	20230009177	159.7898	32.6370	12812	35.06	0.39	
J103918.26+384117.8	20230017745	159.8274	38.6868	7758	34.73	0.38	
J103951.45+435436.2	20230052544	159.9663	43.9099	5727	34.34	0.38	
J104011.39+382533.5	20230017328	160.0515	38.4249	6987	34.43	0.43	
J104049.13+384848.2	20230042377	160.2075	38.8154	7877	33.39	0.42	
J104139.45+431916.9	20230024999	160.4179	43.3204	4218	33.00	0.43	
J105201.86+380616.3	20230055077	163.0075	38.1031	11542	36.68	0.42	
J105429.80+360957.0	20230013555	163.6285	36.1659	7934	35.48	0.41	
J105805.56+411833.8	20230022068	164.5239	41.3062	8518	35.19	0.40	
J105853.24+500952.5	20230052699	164.7239	50.1674	6605	34.27	0.39	
J105924.44+323754.2	20230053651	164.8553	32.6296	12626	35.37	0.45	
J110043.94+490901.0	20230030989	165.1832	49.1469	13887	33.81	0.39	
J110057.00+375523.6	20230016549	165.2338	37.9261	9014	34.29	0.45	
J110118.85+373731.6	20230016116	165.3323	37.6274	10851	35.21	0.40	
J110130.31+374713.2	20230016327	165.3767	37.7880	3779	34.44	0.40	
J110337.13+374924.3	20230016377	165.9050	37.8192	13408	36.05	0.38	
J110443.67+381302.0	20230016979	166.1792	38.2207	9009	34.84	0.38	10
J110802.69+361823.7	20230013776	167.0075	36.3075	8458	33.79	0.42	
J110804.80+443341.1	20230026405	167.0187	44.5638	18349	35.33	0.43	
J110845.92+362540.5	20230013986	167.1963	36.4297	8569	36.38	0.41	
J111156.74+450606.1	20230026891	167.9905	45.1051	7245	32.97	0.42	
J111309.75+435259.5	20230025643	168.2908	43.8845	6324	35.55	0.39	
J111341.58+352903.3	20230012417	168.4283	35.4836	2027	31.69	0.41	
J111747.19+340254.7	20230011170	169.4487	34.0444	12696	36.35	0.43	
J111749.52+361308.7	20230013630	169.4559	36.2181	7838	35.14	0.44	
J111811.78+454253.0	20230027579	169.5494	45.7169	7515	34.27	0.38	2
J112506.70+441125.1	20230026026	171.2811	44.1875	10777	35.46	0.41	
J112721.77+444335.5	20230026554	171.8362	44.7250	13719	37.01	0.38	
J112908.78+452808.7	20230027255	172.2815	45.4711	10570	33.34	0.44	
J113156.59+364347.8	20230014544	172.9846	36.7319	12953	35.76	0.40	
J113242.58+440513.1	20230025882	173.1791	44.0833	13561	36.85	0.41	
J113431.19+330224.9	20230009791	173.6268	33.0398	2913	32.21	0.43	
J113554.36+390240.8	20230018256	173.9789	39.0445	3251	31.79	0.42	
J113621.26+464125.0	20230028769	174.0888	46.6923	10363	35.84	0.46	
J113854.36+493936.9	20230031427	174.7271	49.6604	7434	35.88	0.40	
J114133.61+400513.9	20230020072	175.3941	40.0866	9700	34.97	0.40	
J114244.04+383341.7	20230017524	175.6800	38.5645	12996	36.59	0.40	
J114256.79+355130.3	20230053952	175.7330	35.8613	11413	35.60	0.44	
J114309.97+394656.3	20230019627	175.7943	39.7858	14904	37.27	0.39	
J114314.23+331556.7	20230010169	175.8140	33.2651	10902	36.56	0.39	
J114345.28+334222.6	20230010728	175.9436	33.7046	9627	35.49	0.41	

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J114655.41+325623.8	20230053984	176.7342	32.9402	10409	34.97	0.43	
J114658.18+494700.7	20230031524	176.7423	49.7850	10195	36.80	0.40	21
J115035.94+460202.2	20230028028	177.6507	46.0341	7659	35.02	0.38	
J115059.49+443312.4	20230026398	177.7510	44.5528	7502	35.33	0.40	
J115411.98+505312.6	20230032434	178.5528	50.8907	4349	33.45	0.38	
J115423.75+321508.0	20230065068	178.5971	32.2513	3506	33.18	0.40	
J115530.48+445647.4	20230026770	178.8823	44.9455	5944	32.36	0.44	
J115808.24+440407.0	20230025864	179.5332	44.0699	7163	32.56	0.42	
J115939.21+433605.5	20230052563	179.9107	43.6045	6132	33.30	0.40	
J120006.24+331617.3	20230052074	180.0271	33.2735	6768	34.71	0.41	
J120010.75+445117.8	20230026680	180.0448	44.8509	7483	33.37	0.42	
J120101.16+371616.3	20230015533	180.2583	37.2726	13251	36.66	0.42	
J120243.22+430435.3	20230024716	180.6788	43.0755	11415	34.94	0.41	
J120306.54+440918.2	20230025979	180.7731	44.1519	7396	35.23	0.42	
J120340.53+462406.7	20230055834	180.9186	46.4043	9604	36.64	0.38	
J120409.97+380332.4	20230054762	181.0423	38.0559	8832	36.66	0.39	
J120452.07+465736.5	20230029016	181.2179	46.9643	7466	35.43	0.40	
J120535.16+411725.3	20230022035	181.4001	41.2895	1264	28.81	0.44	
J120628.17+325353.3	20230009615	181.6172	32.9004	7393	35.80	0.39	
J120651.12+431022.1	20230024815	181.7191	43.1732	16625	36.39	0.39	
J120929.91+431151.5	20230024837	182.3725	43.1995	1180	30.46	0.42	
J121117.72+374911.6	20230016370	182.8204	37.8209	1143	29.06	0.41	
J121123.99+475652.9	20230029871	182.8507	47.9465	13875	36.75	0.42	
J121310.38+362642.9	20230014027	183.2915	36.4453	6527	34.50	0.40	
J121422.24+455026.5	20230027772	183.5941	45.8437	15746	35.39	0.38	
J121713.29+431859.1	20230024993	184.3084	43.3148	7235	35.73	0.41	
J121739.55+481507.8	20230030132	184.4109	48.2512	13607	34.70	0.42	
J121843.60+363746.3	20230014361	184.6834	36.6296	16677	36.13	0.40	
J121843.81+445438.9	20230026735	184.6782	44.9098	6061	34.60	0.42	
J121918.34+435017.7	20230025603	184.8322	43.8393	11743	33.92	0.44	
J121950.82+485222.5	20230030730	184.9607	48.8699	7308	36.88	0.38	4
J122312.27+482556.0	20230030319	185.8067	48.4308	6190	32.41	0.43	
J122323.27+390155.4	20230018226	185.8417	39.0334	9502	33.33	0.42	
J122337.68+365726.0	20230014962	185.9097	36.9548	12402	35.70	0.38	
J122351.90+322121.2	20230008713	185.9657	32.3547	9384	37.08	0.38	
J122410.32+445720.6	20230055823	186.0424	44.9557	7329	35.68	0.45	
J122455.72+332750.5	20230010385	186.2314	33.4616	6852	34.23	0.40	
J122513.31+484324.4	20230030601	186.3009	48.7251	4378	32.60	0.42	
J122525.33+335537.9	20230011006	186.3558	33.9280	4116	31.68	0.39	23
J122611.58+410109.7	20230021651	186.5495	41.0183	13969	33.95	0.44	
J122615.21+454514.3	20230027636	186.5690	45.7543	10140	34.35	0.39	
J122719.17+394141.1	20230019444	186.8311	39.6933	8933	35.64	0.39	
J122743.55+383432.2	20230017533	186.9351	38.5766	11036	34.29	0.41	
J122855.97+353643.0	20230012591	187.2360	35.6129	12501	36.74	0.45	

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J123106.54+395633.1	20230055358	187.7783	39.9456	8844	37.15	0.40	
J123159.51+493758.9	20230031397	187.9941	49.6326	4567	31.76	0.37	6
J123249.26+394342.7	20230019528	188.2053	39.7269	6358	33.91	0.44	
J123507.98+322631.5	20230008841	188.7803	32.4408	13705	35.04	0.40	
J123655.00+442031.3	20230026181	189.2285	44.3429	12878	36.26	0.45	
J123718.88+390148.3	20230018219	189.3242	39.0311	6328	33.95	0.40	
J123846.49+462634.3	20230028483	189.6920	46.4445	7462	34.86	0.38	
J123850.72+321630.2	20230008613	189.7130	32.2713	4581	33.42	0.44	
J123947.14+393252.5	20230055538	189.9495	39.5485	12504	35.97	0.39	
J124004.76+385057.3	20230017944	190.0142	38.8499	12643	37.27	0.42	
J124007.59+345257.5	20230054111	190.0276	34.8803	12141	35.69	0.45	
J124029.21+381217.9	20230016956	190.1181	38.2081	9548	33.51	0.38	
J124050.65+452529.2	20230052669	190.2141	45.4212	6098	34.09	0.39	
J124100.49+430623.8	20230024743	190.2559	43.1056	7458	34.74	0.39	
J124115.30+494725.5	20230052705	190.3096	49.7922	5261	34.62	0.42	
J124345.49+431552.8	20230024930	190.9408	43.2691	4800	34.46	0.40	
J124410.96+413900.8	20230055529	191.0472	41.6480	9969	36.25	0.39	
J124615.82+415521.0	20230055689	191.5632	41.9262	7571	34.93	0.39	
J124825.67+362105.2	20230054980	192.1090	36.3548	12069	35.37	0.46	
J124910.21+474004.0	20230029671	192.2938	47.6708	7543	35.30	0.42	
J125051.17+395512.2	20230055539	192.7121	39.9159	12553	37.47	0.39	
J125118.66+330948.8	20230009954	192.8262	33.1671	7207	35.57	0.41	
J125212.38+435611.4	20230025699	193.0550	43.9355	9179	35.11	0.41	
J125258.90+484944.4	20230030703	193.2518	48.8295	6298	33.11	0.42	
J125328.88+342554.7	20230011516	193.3666	34.4320	8537	35.69	0.40	
J125424.98+382627.2	20230054991	193.6059	38.4431	9766	36.79	0.39	
J125518.96+394030.7	20230019392	193.8296	39.6726	7695	35.63	0.39	
J125634.26+383212.2	20230017478	194.1445	38.5384	10659	36.35	0.41	
J125806.25+360243.4	20230054082	194.5289	36.0426	8483	37.04	0.41	
J125819.66+353438.9	20230054080	194.5829	35.5750	11465	35.24	0.42	
J125841.21+444112.3	20230026512	194.6684	44.6883	11722	34.26	0.42	
J130002.83+344634.6	20230011774	195.0085	34.7763	10594	33.93	0.40	
J130014.69+390840.6	20230018403	195.0627	39.1435	16283	36.39	0.39	
J130030.85+403800.2	20230020933	195.1272	40.6351	11328	34.83	0.45	
J130030.85+403800.2	20230020933	195.1307	40.6337	11328	34.33	0.45	
J130055.88+371115.7	20230015391	195.2337	37.1850	7234	33.51	0.42	
J130215.45+331909.4	20230010231	195.5682	33.3169	7998	33.38	0.44	
J130241.04+350452.0	20230054069	195.6754	35.0820	11533	36.17	0.38	
J131200.19+443547.3	20230026435	198.0022	44.5961	8820	33.21	0.42	
J131444.34+400006.4	20230019909	198.6893	40.0010	8445	32.71	0.44	
J131740.14+414203.4	20230022508	199.4182	41.6977	13212	36.94	0.41	
J132011.29+420854.4	20230023164	200.0503	42.1456	8788	34.08	0.44	
J132059.01+345550.3	20230052183	200.2505	34.9322	6210	33.71	0.41	26
J132141.10+392853.1	20230061899	200.4171	39.4837	8317	35.51	0.40	

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J132407.71+390555.1	20230018341	201.0349	39.1010	8299	34.81	0.42	
J132541.96+330816.4	20230061147	201.4258	33.1393	7800	35.38	0.39	22
J132556.98+383543.5	20230017564	201.4877	38.5967	7036	33.46	0.43	
J133136.54+334434.9	20230061294	202.9046	33.7403	7513	33.24	0.44	
J133211.08+464333.6	20230028800	203.0429	46.7230	25071	35.79	0.40	
J133233.50+333359.0	20230058662	203.1415	33.5634	7299	35.08	0.39	
J133247.06+365429.5	20230061719	203.1994	36.9057	5622	34.04	0.41	
J133534.32+494624.8	20230031511	203.8897	49.7740	17550	35.22	0.42	
J133704.90+315336.0	20230058468	204.2694	31.8940	3276	30.79	0.37	16
J133714.71+315332.5	20230008039	204.3112	31.8942	7540	35.08	0.40	17
J133810.75+383943.1	20230017712	204.5439	38.6657	6291	35.84	0.38	
J133940.39+453417.3	20230027395	204.9176	45.5732	12626	36.95	0.41	
J133949.93+371218.4	20230015421	204.9535	37.2039	6677	33.97	0.44	
J133958.19+372332.6	20230015703	204.9924	37.3923	5590	31.97	0.41	
J134432.09+332235.4	20230061207	206.1361	33.3739	12823	36.43	0.41	
J134555.53+410343.6	20230021712	206.4854	41.0629	2779	31.07	0.41	
J134735.86+385511.5	20230018022	206.9044	38.9216	7541	35.85	0.38	
J134748.93+375301.0	20230016477	206.9573	37.8824	3481	32.70	0.40	
J134928.73+463305.7	20230028620	207.3736	46.5529	8527	36.55	0.39	3
J135005.59+462656.6	20230028488	207.5210	46.4504	2006	32.23	0.40	
J135328.24+383337.0	20230017517	208.3719	38.5613	2844	32.54	0.41	
J135341.23+434603.8	20230025524	208.4252	43.7684	17305	37.01	0.42	
J135431.29+461738.9	20230028349	208.6349	46.2926	1891	31.47	0.42	
J135503.89+321740.5	20230008640	208.7693	32.2939	6931	32.70	0.41	18
J135837.75+341409.6	20230011319	209.6566	34.2349	16644	37.23	0.39	
J135843.19+373036.3	20230015909	209.6793	37.5133	2685	31.48	0.40	
J135942.03+430342.9	20230055751	209.9241	43.0596	9844	36.50	0.41	
J140014.98+384433.6	20230017809	210.0585	38.7422	3106	31.33	0.44	
J140213.37+450406.8	20230026862	210.5573	45.0661	3956	33.23	0.41	
J140358.00+490550.3	20230030928	210.9926	49.0978	8690	36.05	0.41	
J140359.85+375302.5	20230016479	210.9986	37.8877	3033	31.68	0.44	
J140953.92+391306.3	20230018519	212.4745	39.2221	9184	33.88	0.44	
J141029.22+385756.7	20230061854	212.6205	38.9637	13907	36.02	0.43	
J141046.03+480512.0	20230052662	212.6934	48.0886	2200	31.22	0.45	
J141135.77+340743.3	20230011230	212.9035	34.1297	10340	35.34	0.42	24
J141235.10+364857.2	20230014675	213.1473	36.8125	12710	35.96	0.42	
J141558.70+493417.8	20230031347	213.9936	49.5710	4252	32.46	0.40	
J142049.05+403912.0	20230020967	215.2050	40.6573	7929	34.58	0.40	
J142353.01+425950.9	20230024640	215.9701	42.9935	6419	32.62	0.40	
J142355.35+431521.3	20230024915	215.9797	43.2540	22792	36.89	0.41	
J142513.47+482723.1	20230062748	216.3112	48.4579	4159	33.24	0.40	
J142817.42+382718.5	20230017369	217.0764	38.4523	8541	33.81	0.42	
J142909.15+325140.8	20230009532	217.2916	32.8586	8834	34.54	0.43	
J142938.08+415739.8	20230062223	217.4115	41.9632	5579	33.29	0.44	

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J143031.51+383824.3	20230017668	217.6282	38.6374	7044	33.31	0.42
J143109.17+372104.7	20230054510	217.7891	37.3555	9731	36.22	0.43
J143957.39+473845.7	20230062619	219.9848	47.6458	2468	31.99	0.43
J144122.49+321633.0	20230008616	220.3439	32.2780	9824	35.99	0.40
J144226.61+452900.9	20230055860	220.6068	45.4828	9807	35.48	0.43
J144804.19+322629.5	20230008839	222.0181	32.4428	9268	32.99	0.42
J145003.25+460302.1	20230028048	222.5139	46.0520	3564	33.46	0.38
J145059.44+363523.0	20230014288	222.7465	36.5871	10182	36.12	0.39
J145155.77+473320.1	20230055855	222.9813	47.5593	11052	35.81	0.43
J145534.67+373919.1	20230016158	223.8920	37.6533	9328	36.62	0.37
J145617.91+410152.4	20230021669	224.0773	41.0351	10045	33.53	0.39
J145620.63+472428.9	20230029410	224.0829	47.4056	7591	34.47	0.39
J145704.38+382242.2	20230017253	224.2728	38.3766	9580	34.87	0.40
J145728.90+433703.6	20230062401	224.3668	43.6166	11463	35.52	0.41
J145935.19+372516.7	20230015755	224.8962	37.4217	8975	36.78	0.40
J150100.02+320013.0	20230008196	225.2534	32.0021	7025	34.83	0.41
J150128.75+491940.4	20230031122	225.3723	49.3275	3686	33.13	0.43
J150242.48+385625.7	20230018050	225.6783	38.9434	9015	34.94	0.39
J150400.88+410439.6	20230055441	226.0066	41.0739	9935	35.70	0.39
J150610.77+392437.0	20230018890	226.5419	39.4092	9396	35.50	0.40
J150612.70+364532.6	20230014589	226.5502	36.7623	16753	36.68	0.41
J150620.71+401724.6	20230020335	226.5877	40.2899	9565	35.40	0.43
J150626.60+402341.8	20230020480	226.6162	40.3966	9568	34.33	0.38
J150628.73+391647.4	20230018610	226.6190	39.2808	11375	35.89	0.43
J150634.66+394840.5	20230019664	226.6463	39.8101	15538	37.39	0.41
J150643.62+335945.6	20230011118	226.6783	33.9933	13525	35.07	0.44
J150735.48+342851.8	20230011556	226.9025	34.4812	9130	36.10	0.39
J150902.93+401915.3	20230020375	227.2618	40.3212	9580	35.12	0.41
J150948.38+405436.1	20230021509	227.4495	40.9109	9371	35.79	0.39
J151125.25+380858.9	20230016878	227.8529	38.1482	9028	35.03	0.43
J151144.59+393448.2	20230019223	227.9350	39.5809	16001	36.26	0.39
J151335.69+401610.8	20230020312	228.4025	40.2688	18650	36.22	0.39
J151543.24+333406.9	20230010519	228.9295	33.5674	9661	33.82	0.46
J151859.48+403435.6	20230020855	229.7450	40.5778	16222	37.86	0.41
J152038.23+405823.7	20230021590	230.1602	40.9718	5419	33.95	0.40
J152134.12+375524.6	20230016551	230.3871	37.9231	13617	35.84	0.42
J152612.81+424526.7	20230024260	231.5542	42.7570	5911	33.71	0.41
J152839.11+373949.2	20230016173	232.1644	37.6664	9124	35.64	0.41
J152914.13+401302.6	20230020251	232.3105	40.2182	2773	32.84	0.39
J152922.61+342100.2	20230052169	232.3472	34.3500	5540	33.96	0.42
J153812.30+420607.7	20230023084	234.5557	42.0999	16331	35.62	0.42
J153947.99+322758.6	20230008886	234.9531	32.4644	14979	34.62	0.41
J154202.30+400416.8	20230020019	235.5090	40.0756	8469	34.10	0.43
J154347.77+352946.3	20230012437	235.9496	35.4923	23360	35.30	0.44

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Table 3 – *Continued*

J154719.68+454948.6	20230027751	236.8337	45.8304	10410	34.36	0.41	
J155144.64+421024.8	20230023204	237.9330	42.1707	6506	34.74	0.44	
J155229.40+392117.6	20230018776	238.1263	39.3520	8026	35.03	0.39	
J155908.03+392812.1	20230019016	239.7811	39.4674	20436	35.08	0.45	
J160323.92+472520.4	20230029425	240.8484	47.4236	6151	35.14	0.39	
J160352.62+495319.4	20230031638	240.9677	49.8856	6158	34.39	0.40	
J161220.53+393957.5	20230019371	243.0803	39.6660	9387	35.92	0.38	
J161327.62+424456.0	20230024233	243.3651	42.7531	6841	34.61	0.44	
J162130.95+370232.3	20230015095	245.3817	37.0444	4975	33.11	0.42	
J162245.41+384523.9	20230017825	245.6880	38.7526	9038	35.55	0.41	
J162412.60+315241.2	20230060975	246.0541	31.8758	6326	36.53	0.41	
J162456.87+381503.9	20230017039	246.2366	38.2528	9710	36.02	0.40	
J162525.53+490649.8	20230030947	246.3575	49.1167	8827	33.82	0.39	
J162539.49+394839.9	20230061943	246.4127	39.8102	9555	35.61	0.38	
J162625.31+391914.0	20230051180	246.6010	39.3218	16712	37.53	0.42	
J162833.96+414406.0	20230062166	247.1375	41.7335	9727	36.54	0.40	
J163143.21+362005.8	20230013826	247.9317	36.3388	9519	34.77	0.39	
J163419.33+400227.9	20230062020	248.5847	40.0409	7770	34.35	0.43	
J163449.36+381944.3	20230017192	248.7081	38.3267	18793	36.72	0.44	
J163551.54+424636.3	20230024289	248.9642	42.7752	18195	38.11	0.38	
J163817.71+402325.1	20230020470	249.5733	40.3896	7772	35.24	0.38	
J163944.87+472036.1	20230029351	249.9356	47.3449	9190	35.32	0.41	
J164009.52+350557.8	20230012012	250.0390	35.0979	9411	35.60	0.39	
J164030.21+525801.2	20230034455	250.1242	52.9644	22711	36.96	0.39	
J164103.74+331615.1	20230010176	250.2638	33.2724	9403	35.58	0.38	1
J164126.30+401234.2	20230020239	250.3639	40.2099	9863	36.37	0.39	
J164243.40+401502.1	20230020289	250.6819	40.2473	7744	35.67	0.38	
J164451.57+524605.4	20230034215	251.2181	52.7682	8750	34.49	0.37	8
J164527.75+524523.2	20230034203	251.3620	52.7565	8776	35.12	0.39	
J164543.59+525330.1	20230034364	251.4331	52.8928	8784	35.95	0.41	
J164625.07+393636.4	20230019268	251.6044	39.6107	10095	35.61	0.45	
J164758.02+373647.7	20230016098	251.9919	37.6124	10168	36.24	0.41	
J165045.08+523925.4	20230034061	252.6931	52.6577	3248	34.03	0.38	
J165123.69+522952.0	20230033901	252.8509	52.4994	10514	36.30	0.41	
J165527.98+384512.4	20230017821	253.8648	38.7506	22613	35.11	0.41	
J170410.96+352743.5	20230012373	256.0458	35.4593	10901	35.59	0.39	
J170708.90+401328.5	20230020262	256.7903	40.2234	8138	34.85	0.39	
J171454.67+353126.4	20230012470	258.7270	35.5224	11230	33.76	0.39	14
J171750.07+384919.6	20230017911	259.4616	38.8250	10715	36.59	0.38	
J171759.13+332016.2	20230010256	259.4981	33.3344	4522	33.59	0.38	

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5 MCG +08-14-026   6 MCG +08-23-049   7 MCG+08-14-028 8 MCG +09-27-070
9 AGC 206514   10 UGC 6140   11 UGC 3686   12 UGC 3572
13 UGC 3568   14 IC 1249   16 AGC 239112   17 AGC 239249

18 AGC 748299   19 AGC 206232   20 AGC 208886   21 AGC 219839
22 AGC 234633   23 AGC 229450   24 AGC 245424   26 AGC 239200
27 MCG+08-13-040

Acknowledgements

Data Availability

These data are all publicly available.