An H I survey of highly flattened, edge-on, pure disk galaxies

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Abstract. We have undertaken an H I 21-cm line survey of 472 late-type, edge-on spiral galaxies using the Nançay Radio Telescope and the Green Bank 140-Foot Telescope. Our targets consisted of highly inclined spirals with large disk axial ratios and little or no bulge component—i.e., highly flattened, pure disk galaxies. These objects were primarily selected from the Flat Galaxy Catalogue (FGC) of Karachentsev et al. (1993). Most were classified as Hubble types Scd or later, with an emphasis on the largest angular size and lowest optical surface brightness objects in the FGC. Our detection rate was $\sim 50\%$, underscoring that relatively small, gas-rich, moderate-to-low surface brightness pure disk spirals are an extremely common constituent of the nearby universe. Our data also suggest that the most highly flattened spirals are primarily isolated systems. The majority of our detected galaxies had no previously published redshifts or H I data. Here we present H I parameters for the 239 detected sources and 45 marginal detections, together with search limits for the undetected galaxies.

Key words: galaxies: general — galaxies: ISM — galaxies: fundamental parameters — galaxies: spiral — radio lines: galaxies

1. Introduction

When viewed very near edge-on, a subset of spiral disk galaxies is seen to exhibit highly flattened stellar disks with large disk axial ratios and little or no bulge component. These objects can be described as examples of pure disk galaxies.

Some of the most striking examples of pure disk galaxies are the so-called “superthin” spirals (see Vorontsov-Vel’yaminov 1967; Goad & Roberts 1981; Matthews et al.

1999). Superthins are so named because they exhibit extraordinarily small stellar scale heights ($h_z \lesssim 200$ pc; Matthews et al. 2000a,b) and no trace of a bulge, implying their disks are extremely dynamically cold. The superthins are of particular interest in studies of disk evolution, since they appear to be among the least evolved nearby galaxies both dynamically and in a star-formation sense (Goad & Roberts 1981; Bergvall & Rönnback 1995; Matthews et al. 1999). Superthins can thus serve as important laboratories for exploring aspects of the early stages of disk evolution right within the local universe (e.g., Matthews et al. 2000b). These galaxies can also be used for gauging the effects of environment on disk thickness and morphology (cf., Odewahn 1994; Reshetnikov & Combes 1997), on disk surface brightness (cf., Bothun et al. 1993), and on bulge formation (cf., Sofue & Habe 1992).

Not surprisingly, the majority of pure disk galaxies are of very late Hubble types, the largest fraction being classified as Sc-Sd (Karachentsev et al. 1993). However, not all late-type, pure disk systems are “superthin”. For example, some Magellanic spirals may have intrinsically thicker disks of somewhat larger scale height, yet still lack a bulge component and appear rather flattened when viewed near edge-on. Examples include the nearby Sdm galaxies UGC 4704 ($a/b = 10$) and UGC 5245 ($a/b = 8$). Interestingly, superthin and Magellanic spirals, as well as other varieties of extreme late-type spirals may often be virtually indistinguishable in terms of many of their global physical properties (e.g., luminosity, rotational velocity, $\mathcal{M}_{\text{HI}}$, $\frac{\mathcal{M}_{\text{HI}}}{L_B}$) and in terms of their rotation curve shapes (e.g., Goad & Roberts 1981; Matthews 1998). The origin of this morphological diversity in an otherwise similar physical parameters space remains unclear, although environment (e.g., Odewahn 1994) and dark matter halo properties (e.g., Levine & Sparke 1998) likely play key roles.

Studies of a variety of types of pure disk galaxies are of considerable interest from a galaxy evolution perspective, since these objects can help to shed insight into the question of what forms first, the bulge (e.g., Andredakis

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1998) or the disk of a galaxy (e.g., Courteau et al. 1996). Dynamically speaking, pure disks are simpler systems than bulge-dominated galaxies, hence they can also be used to explore the complex problems of how angular momentum is transported in disks over time (e.g., Lin & Pringle 1987) and how galaxy disks are dynamically heated (e.g., Lacey 1991 and references therein).

For investigating a variety of questions related to galaxy disk evolution and dynamics, there are a number of advantages to studying galaxies oriented nearly edge-on. For example, only in edge-on galaxies may the vertical structure and scale height of the disk be directly probed. Vertical color gradients measured in highly inclined disks can also be used as a tracer of dynamical heating processes (e.g., Just et al. 1996), and an edge-on orientation can permit the derivation of unique constraints on the shape and mass of dark matter halos (e.g., Olling 1996).

Edge-on, pure disk spirals are not only interesting as individual objects. Fesenko (1982) and Karachentsev (1989) were among the first to recognize that statistical studies of such objects could provide a powerful means of addressing important problems in galaxy evolution and cosmology. A principle advantage of such galaxies is that they are readily and reliably classifiable over a wide range of distances. In addition, their rotation axes, inclinations, and angular diameters can be determined far more accurately than for spirals at smaller inclinations (Fesenko 1982; Karachentsev 1989).

Karachentsev (1989) has established that in most cases, distances to edge-on, highly flattened galaxies may be reliably determined using either the Tully-Fisher relation or linear size-linewidth correlations (see also Karachentsev 1991; Karachentsev et al. 1995; Kudrya et al. 1997b). Moreover, the thinnest edge-on spirals generally appear to reside outside of dense groups and clusters (e.g., Karachentsev 1999). Therefore, as noted by Karachentsev (1989), they should also typically be free of tidally-induced distortions or asymmetries that can cause scatter in such relations (cf., Franx & de Zeeuw 1992). Reshetnikov & Combes (1998, 1999) have also shown that samples of edge-on pure disks are ideal for statistically studying the origin and frequency of galactic warps. For all of these reasons, samples of flat, edge-on, pure disk galaxies can provide an excellent means of exploring issues ranging from large-scale galaxy flows, the clustering of late-type disks, to anisotropy in galaxy orientations, the formation processes for galaxy disks, the influence of environment on disk properties, and the Tully-Fisher relation and its dependence on environment and luminosity.

With goals such as these in mind, in 1993, Karachentsev et al. published the “Flat Galaxy Catalogue” (hereafter the FGC). This catalogue was compiled through the visual inspection of photographic survey plates covering the entire sky. In total, it contains 4455 edge-on spiral galaxies with $D_{25} \geq 0.6$ and apparent

Fig. 1. North-South extent of the Nançay telescope beam (FWHP), in arcminutes, as a function of declination, in degrees. Diamonds show data points measured by E. Gérard (1998, private communication), and the dashed line is an interpolation between the measured points

axial ratios $a/b \geq 7$. Approximately 56% of the galaxies were previously uncatalogued (Karachentsev et al. 1994). A new, improved version of this catalogue (the Revised Flat Galaxy Catalogue) has also recently been published by Karachentsev et al. (1999).

As of 1997, published redshifts existed for only about 20% of the FGC galaxies (Kudrya et al. 1997a), and HI fluxes and linewidths for even fewer. However, such data are a crucial part of fulfilling the types of scientific goals outlined above. To help remedy this situation, Giovanelli et al. (1997) published HI parameters for 744 of the FGC galaxies, obtained primarily with the Arecibo Telescope.

Although the Giovanelli et al. (1997) database has already proven to be valuable for a variety of investigations (e.g., Karachentsev et al. 1995, 1999; Impey et al. 1999), obtaining redshifts for a significant sample of FGC objects outside the Arecibo declination limits is necessary for more accurately mapping the amplitude and direction of the bulk motion of galaxies with respect to the cosmic flow (e.g., Makarov et al. 1997a,b). In addition, because of the deeper limiting magnitudes of the southern sky plate material used by Karachentsev et al. (1993), the Arecibo sample is expected to be somewhat under-represented in lower surface brightness objects. Finally, because of the local galaxy distribution in the northern hemisphere (e.g., the presence of the Virgo cluster), a sample covering the Arecibo declination zone is likely to contain fewer examples of new pure disk systems within the Local Supercluster than samples that include southern declinations (see e.g., Matthews & Gallagher 1997). For these reasons, we have used the Nançay Radio Telescope and the Green Bank 140-Foot Telescope to undertake a complementary HI survey of highly inclined, highly flattened pure disk galaxies over the declination range $-44.5^\circ \leq \delta \leq 90^\circ$.

Table 1. Detected galaxies

Galaxy Name (1)	α (B1950.0) (2)	δ (B1950.0) (3)	Type (4)	$a \times b$ (5)	rms (6)	F_{max} (7)	W_{20} (8)	W_{50} (9)	$W_{20,c}$ (10)	$W_{50,c}$ (11)	V_h (12)	$\sigma(V)$ (13)	S (14)	$\sigma(S)$ (15)	S_c (16)	S/N (17)	Notes (18)
FGC 1	00 01 29.4	-07 15 21	Sm	0.78×0.11	1.86	18.9	135	102	125	99	3725	6	1.89	0.38	1.91	10.1	d,*
FGCE 22	00 08 56.5	-32 42 50	Sd	1.18×0.11	3.87	17.2	164	131	152	126	6612	16	1.76	0.77	1.76	4.4	d,*
ESO 350-005	00 13 45.1	-34 47 15	Sd	1.12×0.12	3.82	14.6	287	267	275	258	7437	11	2.36	0.96	2.39	3.8	n,*
ESO 350-012	00 20 28.3	-36 05 37	Sd	0.90×0.11	3.82	18.8	229	202	215	195	7440	12	2.99	0.96	3.00	4.9	*
FGC 45	00 23 20.2	+49 12 16	Sm	1.06×0.11	4.90	15.2	190	142	178	138	5174	25	1.30	0.90	1.30	3.1	*
UGC 347	00 32 23.3	+45 15 27	Sd	1.18×0.16	3.52	15.6	245	206	232	200	5103	16	1.82	0.76	1.87	4.4	e
FGCE 62*	00 33 41.2	-36 53 48	Sd	0.81×0.11	5.70	20.0	145	75	136	73	1527	27	1.84	1.09	1.86	3.5	d,*
FGC 83	00 39 50.2	-16 15 52	Sd	1.23×0.09	2.77	22.9	204	190	193	186	3913	5	3.23	0.65	3.26	8.3	*
FGC 84	00 42 07.2	-11 27 43	Scd	1.12×0.09	3.18	11.6	295	172	279	165	8111	34	1.67	0.76	1.69	3.7	b,G
ESO 295-007	00 46 10.2	-40 26 44	Scd	1.52×0.21	11.9	43.0	171	158	164	155	3548	8	1.98	1.17	2.09	3.6	b,G
FGC 96	00 48 17.8	+00 34 47	Sd	1.01×0.11	3.56	13.2	230	191	218	186	4567	19	1.69	0.80	1.72	3.7	*
UGC 825	01 14 37.2	+48 44 46	Sd	1.46×0.17	4.90	14.8	334	292	320	285	5338	24	2.69	1.32	2.73	3.0	*
FGC 155	01 18 50.9	-02 07 30	Sdm	1.03×0.12	2.71	19.2	149	122	139	119	2217	8	1.77	1.14	1.79	2.7	b
FGC 173	01 32 19.9	-03 18 34	Sd	1.36×0.11	3.47	15.4	246	194	233	188	5927	18	2.26	0.84	2.33	4.4	d,*
FGC 175	01 32 57.1	+01 46 42	Sdm	1.29×0.12	2.63	31.0	176	156	166	153	2611	4	4.31	0.62	4.46	11.8	*
FGC 181	01 36 40.2	-10 45 18	Sd	1.73×0.11	3.91	16.1	266	212	253	206	5553	20	2.49	0.97	2.57	4.1	*
FGC 191	01 41 38.8	+27 40 21	Sd	1.29×0.13	3.31	17.7	208	172	196	167	4771	12	2.30	0.75	2.34	5.4	*
FGC 196	01 46 53.7	+28 28 12	Sd	1.18×0.10	5.02	13.7	217	202	203	195	7895	16	1.77	1.14	1.79	2.7	G
FGC 202	01 50 24.4	+20 25 43	Sdm	1.12×0.15	2.83	23.6	109	77	100	74	2400	8	1.75	0.48	1.79	8.3	*
FGC 205	01 50 47.8	+18 08 21	Sdm	1.06×0.10	2.83	11.2	217	195	205	190	4900	13	1.89	0.73	1.94	4.0	*
UGC 1461	01 56 16.6	+05 21 05	Sd	1.29×0.13	3.27	6.6	259	230	246	224	5833	30	1.18	0.87	1.18	2.0	*
FGC 221	01 56 33.5	+39 50 50	Sd	1.02×0.11	3.31	17.7	208	172	196	167	4771	12	2.30	0.75	2.34	5.4	*
FGC 272	02 15 06.5	-11 43 46	Sdm	1.22×0.17	8.70	36.0	314	257	305	252	3976	15	5.53	1.58	...	4.1	G
FGC 273*a	02 15 19.5	-07 03 41	Sdm	1.34×0.16	3.59	28.8	214	134	204	131	2164	12	3.76	0.82	...	8.0	*
FGC 273*b	...	...	...	...	7.43	23.1	331	329	315	319	7100	5	3.63	1.85	...	3.1	*
FGC 277	02 17 02.4	+18 45 05	Sd	0.90×0.08	2.47	10.7	212	194	200	189	4316	11	1.72	0.62	1.73	4.3	*
FGC 282	02 19 11.2	-09 55 19	Sd	1.27×0.11	3.46	20.5	226	202	214	197	4700	9	3.56	0.91	3.65	5.9	*
FGC 288	02 21 51.0	+19 09 06	Sdm	1.34×0.17	4.55	18.8	308	254	293	246	6583	20	3.24	1.19	3.36	4.1	*
FGC 295	02 24 28.7	-02 55 04	Sdm	1.29×0.17	2.86	21.4	231	218	219	213	4482	6	3.50	0.73	3.61	7.5	d,e
UGC 2157	02 37 17.5	+38 20 58	Sdm	2.52×0.59	3.13	21.0	124	92	115	90	488	9	2.27	0.65	2.39	6.7	d,e
ESO 546-021	02 45 24.3	-19 02 55	Sdm	1.25×0.17	3.17	30.3	174	160	163	156	3065	4	4.24	0.75	4.24	9.6	*
UGC 2382	02 51 58.6	+09 09 20	Sd	1.15×0.11	4.05	15.9	384	364	366	353	7520	13	2.41	0.99	2.44	3.9	*
UGC 2496	02 59 08.5	+46 14 49	Sd	1.20×0.12	4.33	15.9	353	340	337	330	6780	11	3.00	1.18	3.08	3.7	*
FGC 382	03 02 19.0	-12 48 41	Sd	1.00×0.11	2.98	13.0	171	150	160	146	4364	12	1.71	0.68	1.71	4.4	d,*
ESO 547-012	03 07 19.0	-18 01 18	Sdm	1.18×0.13	3.53	31.0	136	121	126	118	2006	5	3.44	0.74	3.53	8.8	d,*
FGC 402	03 12 46.9	-07 27 20	Scd	1.70×0.17	3.17	14.2	436	405	414	391	9386	14	3.17	0.94	3.26	4.5	*
FGC 407	03 14 57.0	-15 14 20	Sd?	1.46×0.12	3.70	16.6	451	380	429	366	9527	21	3.29	1.04	3.34	4.5	*
FGC 408	03 15 33.5	-17 24 56	Sdm	1.00×0.10	2.05	15.1	238	212	224	205	6903	8	2.05	0.47	2.08	7.4	p
FGC 410	03 17 23.8	-03 46 07	Sd	2.02×0.21	2.42	18.7	260	236	249	232	2756	7	3.04	0.61	3.04	7.7	p
FGC 417	03 20 40.3	+10 58 29	Sd	2.46×0.27	2.77	49.1	323	293	308	285	6165	3	9.73	0.78	9.73	17.7	*
ESO 548-009	03 22 22.6	-19 28 30	Sm	1.29×0.11	4.20	17.5	215	195	205	192	1885	12	1.71	0.83	1.76	4.1	*
UGC 2728	03 22 23.9	+41 53 25	Sd	1.12×0.17	3.65	14.8	272	222	258	215	6510	19	2.41	0.93	2.45	4.1	*
UGC 2731*a	03 22 40.2	+41 51 22	Sd	1.12×0.17	5.33	17.6	262	228	252	225	969	20	2.92	1.37	...	3.3	*
UGC 2731*b	...	...	...	...	3.43	8.20	387	371	367	358	9082	19	1.88	1.03	...	2.4	*
UGC 2782	03 30 11.6	+40 11 53	Sdm	1.30×0.2	3.12	13.1	331	291	316	284	5535	17	2.38	0.83	2.46	4.2	n
FGC 434	03 31 22.1	-09 59 36	Sd	1.25×0.11	2.96	13.3	232	210	220	205	4012	12	1.69	0.66	1.70	4.5	n,*
FGC 436	03 22 00.9	+14 58 25	Sd	1.03×0.10	8.82	17.9	234	224	221	217	6166	17	2.56	2.10	2.56	2.0	p
FGC 453	03 45 00.0	-14 51 14	Sdm	1.20×0.15	3.61	22.9	214	126	204	123	1697	17	2.68	0.78	2.72	6.3	p
FGC 459	03 54 57.8	-03 23 16	Sd	1.46×0.19	2.85	16.1	246	181	234	176	4090	16	2.13	0.65	2.19	5.6	*
FGC 470	04 10 58.0	+26 37 23	Sd	1.01×0.11	3.06	18.7	260	240	247	234	5555	8	3.18	0.79	3.25	6.1	*

Table 1. continued

Galaxy Name (1)	α (B1950.0) (2)	δ (B1950.0) (3)	Type (4)	$a \times b$ (5)	rms (6)	$F_{\max}$ (7)	W_{20} (8)	W_{50} (9)	$W_{20,c}$ (10)	$W_{50,c}$ (11)	V_h (12)	$\sigma(V)$ (13)	S (14)	$\sigma(S)$ (15)	S_c (16)	S/N (17)	Notes (18)
FGC 476	04 16 12.4	-15 06 31	Scd	1.70×0.17	2.99	10.6	406	370	386	358	8681	19	1.93	0.80	1.94	3.6	*
FGC 483	04 22 36.1	+04 52 17	Sd	0.99×0.09	3.05	9.4	272	242	259	236	4966	20	1.38	0.74	1.39	3.1	*
ESO 303-019	04 26 32.6	-41 47 34	Sd	1.37×0.11	10.6	43.0	311	198	302	194	4471	22	4.61	1.60	4.95	4.0	G
FGCE 415*	04 31 44.9	-20 19 39	Sd	0.68×0.07	5.66	19.7	105	83	96	80	1599	15	1.61	1.02	1.62	3.5	d,*
FGC 495	04 35 01.3	-03 12 13	Sd	1.46×0.18	2.82	12.8	248	232	236	227	4424	10	2.44	0.78	2.54	4.5	*
UGC 3172	04 45 16.8	+08 37 29	Sd	1.90×0.15	2.90	13.7	364	360	350	352	4733	5	2.88	0.82	2.99	4.8	*
ESO 552-016	04 50 17.0	-19 22 33	Sdm	0.90×0.12	1.70	22.5	188	165	178	161	3056	4	3.23	0.40	3.24	13.2	*
FGC 516	04 54 13.1	-12 28 45	Scd	1.36×0.16	3.23	16.2	232	186	220	182	3985	17	2.45	0.88	2.53	5.0	*
FGC 517	04 55 16.3	-11 54 12	Scd	1.18×0.10	3.64	22.5	376	331	358	320	7909	12	3.57	0.91	3.57	6.2	p,*
FGC 519	05 00 15.9	-02 21 27	Sd	1.12×0.12	3.57	15.8	219	205	207	200	4456	9	2.00	0.80	2.01	4.4	
FGC 523	05 05 10.6	-11 42 22	Sd	2.26×0.17	2.45	37.7	249	231	238	227	2358	3	6.60	0.64	6.60	15.3	
FGC 524	05 06 26.6	+85 37 13	Sc	0.83×0.09	5.72	22.3	222	198	211	194	3712	14	2.50	1.20	2.52	3.9	n,*
FGC 547	05 49 26.8	+78 45 38	Sdm	0.93×0.12	4.44	11.1	265	193	250	186	7821	38	1.69	1.09	1.71	2.5	n
FGC E553	05 59 56.5	-34 56 37	Sd	0.90×0.11	3.07	34.8	123	100	114	98	1306	5	3.44	0.61	3.49	11.4	
UGC 3406	06 05 30.1	+67 15 49	Sd	1.46×0.11	5.61	15.6	297	262	283	256	5204	24	2.91	1.52	2.94	2.8	
FGC 556	06 06 58.5	+55 21 09	Sd	0.87×0.11	3.03	16.0	232	219	219	212	6388	8	2.58	0.77	2.60	5.3	
ESO 489-033	06 16 07.0	-24 54 00	Sd	1.02×0.14	3.70	17.3	158	146	148	143	2033	8	2.04	0.80	2.05	4.7	
FGC 563	06 18 35.9	-05 50 28	Sm	1.79×0.22	3.56	66.2	145	113	136	111	789	3	7.48	0.75	7.78	18.6	d
UGC 3485	06 29 53.7	+65 52 20	Sdm	1.21×0.10	5.58	39.9	136	117	127	114	1285	7	4.09	1.12	4.22	7.2	
FGC 576	06 31 08.4	+53 31 01	Sd	1.55×0.10	2.11	17.0	360	323	342	313	7973	8	4.55	0.69	4.75	8.1	
ESO 427-008	06 46 52.0	-32 02 12	Sd	1.68×0.12	3.73	33.2	161	142	151	139	2802	6	3.09	0.72	3.09	8.9	
FGCE 632	06 54 36.1	-28 39 14	Sd	0.92×0.11	2.61	15.1	298	186	283	180	6602	21	2.74	0.70	2.76	5.8	
UGC 3761	07 11 43.3	+38 13 58	Sdm	1.66×0.22	3.65	34.4	195	179	184	175	3350	5	4.44	0.82	4.47	9.4	
FGC 614	07 13 31.5	+30 21 08	Sd	0.91×0.09	1.86	18.7	195	181	184	177	3287	4	2.86	0.46	2.90	10.1	p
FGC 623	07 16 01.8	+13 37 00	Sdm	0.88×0.10	3.32	12.1	324	194	310	189	4577	35	1.76	0.80	1.76	3.6	*
UGC 3853	07 23 56.5	+48 32 55	Sd	1.06×0.13	3.81	41.7	129	109	120	107	936	4	4.60	0.80	4.60	10.9	
UGC 3921	07 32 39.4	+70 57 56	Sd	1.23×0.11	5.56	26.4	224	189	214	185	2475	14	3.48	1.27	3.55	4.8	
FGC 654	07 40 34.8	+59 06 04	Sdm	1.08×0.11	5.44	13.5	136	43	126	40	5174	44	0.82	0.84	0.82	2.5	n,*
FGC 660	07 44 57.4	+28 31 43	Sd	1.23×0.12	3.10	15.9	218	196	206	191	4724	10	2.42	0.76	2.49	5.1	
FGC 675	07 50 23.2	+39 54 53	Sd	0.99×0.11	3.93	16.6	177	174	166	170	3876	5	1.81	0.82	1.85	4.2	
FGC 684	07 52 34.6	+28 52 19	Sd	0.96×0.08	4.92	15.5	228	118	215	114	6412	37	2.00	1.11	2.01	3.2	*
FGC 689	07 54 11.7	+35 51 09	Sd	1.19×0.10	3.34	17.8	314	246	301	241	4163	17	3.46	0.91	3.47	5.4	*
FGC 699	07 58 05.5	+08 46 37	Sd	0.97×0.10	3.64	15.6	198	158	188	155	2532	16	2.30	0.88	2.33	4.3	
FGC 725	08 09 57.7	+71 11 29	Sd	0.94×0.09	6.68	31.2	250	167	238	162	4544	22	5.39	1.7	5.47	4.7	b,n
FGC 746	08 21 03.4	+34 29 26	Sd	1.14×0.10	2.41	12.4	219	204	207	198	5196	9	1.69	0.56	1.73	5.1	
FGCE 707	08 31 40.1	-21 12 30	Sd	1.29×0.10	3.57	15.1	232	206	220	201	4733	14	1.94	0.80	1.94	4.2	
FGCE 721	08 47 39.3	-20 27 53	Sd	0.92×0.10	3.29	21.2	144	137	134	134	3231	5	2.0	0.63	2.02	6.4	p
ESO 563-029	08 49 20.2	-21 27 32	Sd	1.37×0.11	3.42	27.5	191	168	181	164	2537	7	3.28	0.74	3.28	8.0	*
FGC 821	08 56 45.4	-04 41 02	Sdm	0.90×0.10	2.77	17.8	191	126	180	122	3596	14	2.12	0.60	2.12	6.4	*
FGC 826	08 58 01.9	+50 48 23	Sdm	1.56×0.20	4.59	25.5	122	68	113	66	712	15	2.14	0.84	2.14	5.6	d,*
ESO 564-006	08 59 08.0	-19 17 06	Sdm	1.4×0.20	2.88	20.6	222	197	210	192	5208	8	3.13	0.71	3.19	7.2	
UGC 4753	09 01 12.3	+45 29 22	Sdm	1.76×0.20	3.18	26.1	225	172	215	169	1851	10	3.93	0.78	4.00	8.2	
FGC 842	09 04 38.4	+28 50 23	Sd	1.10×0.10	3.40	12.2	346	264	330	256	6710	28	2.20	0.91	2.21	3.6	
ESO 564-022	09 04 56.0	-17 34 00	Irr	1.4×0.2	2.74	24.1	140	78	130	75	2611	10	2.09	0.51	2.17	8.8	d
ESO 497-020	09 09 05.8	-23 50 11	Sd	1.12×0.13	2.77	9.3	256	235	241	227	7422	15	1.70	0.74	1.70	3.4	
ESO 564-033	09 13 40.2	-18 42 44	Sdm	1.15×0.15	2.50	24.4	271	251	258	245	5167	5	4.15	0.65	4.26	9.7	
FGC 878	09 18 18.8	-03 34 14	Sm	0.85×0.10	3.15	14.9	169	144	158	140	3489	12	1.64	0.66	1.66	4.7	d
FGCE 745	09 21 26.2	-23 01 53	Sdm	1.10×0.13	3.34	16.7	229	192	316	188	2480	14	2.61	0.83	...	5.0	c,p,*
FGC 888	09 22 32.0	+12 22 09	Sdm	1.23×0.11	3.70	12.3	334	288	316	278	8645	23	2.00	0.94	2.06	3.3	
UGC 5047	09 25 22.9	+51 46 39	Sdm	1.55×0.15	4.01	19.3	155	81	146	79	507	20	1.97	0.81	1.98	4.8	d,e

Table 1. continued

Galaxy Name (1)	α (B1950.0) (2)	δ (B1950.0) (3)	Type (4)	$a \times b$ (5)	rms (6)	$F_{\max}$ (7)	W_{20} (8)	W_{50} (9)	$W_{20,c}$ (10)	$W_{50,c}$ (11)	V_h (12)	$\sigma(V)$ (13)	S (14)	$\sigma(S)$ (15)	S_c (16)	S/N (17)	Notes (18)
FGC 913	09 33 46.6	+15 46 21	Sd	1.10×0.10	2.90	11.6	211	178	199	173	4332	16	1.57	0.67	1.57	4.0	
UGC 5148	09 36 52.2	+11 44 16	Sdm	1.21×0.17	2.94	16.9	427	312	412	304	5890	19	4.17	0.84	4.26	5.7	
ESO 566-006	09 42 20.9	-21 02 00	Sd	1.18×0.11	2.57	8.2	223:	210:	211	205	4547	13	1.36	0.66	1.38	3.2	n
FGC 937	09 42 57.1	-13 31 10	Sd	1.79×0.10	3.21	30.3	200	169	190	166	2352	7	3.95	0.73	4.07	9.4	p
FGC 940	09 44 20.5	-06 22 31	Sdm	1.01×0.09	3.26	16.6	192	160	181	156	4387	12	2.31	0.76	2.33	5.1	
FGC 943	09 44 44.5	+24 08 13	Sd	1.01×0.09	1.99	11.9	241	214	227	207	7125	10	1.57	0.45	1.58	6.0	
UGC 5289*	09 48 54.3	-01 30 48	Sd	1.06×0.11	2.91	14.2	174	156	164	152	2865	10	1.65	0.62	1.66	4.9	*
UGC 5301	09 50 13.9	+43 04 56	Sd	1.46×0.16	5.48	17.6	253	238	240	232	4841	14	2.78	1.37	2.80	3.2	c,*
FGC 964	09 50 41.9	-06 14 45.0	Sd	1.47×0.10	2.45	8.4	163	153	151	148	5675	11	1.28	0.60	1.30	3.4	
FGC 969	09 51 45.9	+29 57 10	Sd	1.21×0.11	3.0	8.1	267	263	253	255	6465	8	1.24	0.74	1.24	2.7	b,n,*
UGC 5394	09 58 49.8	+36 44 27	Sdm	1.68×0.20	3.65	51.9	170	146	160	143	1433	4	6.45	0.81	6.71	14.2	
FGC 999	10 00 15.9	+78 01 22	Sdm	0.93×0.11	5.99	15.2	253:	231:	243	227	1956	21	2.39:	1.50	2.40	2.5	n
UGC 5413	10 00 46.4	+13 20 45	Sd	1.37×0.17	2.81	9.7	349	312	331	302	8290	20	1.90	0.78	1.90	3.4	
ESO 435-044	10 06 10.7	-30 44 57	Sd	1.37×0.17	3.36	49.5	168	147	158	144	2199	4	6.36	0.76	6.37	14.8	*
FGC 1028	10 08 39.9	+62 20 41	Sd	1.12×0.11	5.30	18.7	250:	134:	239	131	3150	34	2.47:	1.21	2.5	3.5	n,*
FGC 1063	10 21 55.7	+12 09 56	Sdm	1.10×0.11	3.63	20.8	167	142	157	139	2430	10	2.06	0.72	2.06	5.7	
FGC 1065	10 23 00.2	-15 05 33	Sd	1.75×0.12	2.84	18.5	274	242	264	238	2028	10	3.22	0.75	3.23	6.5	
ESO 568-010	10 24 06.0	-21 03 44	Sd	1.16×0.09	3.66	30.3	320	310	306	302	5507	4	6.20	1.04	6.35	8.3	
FGC 1071	10 24 30.2	-15 49 23	Sd	1.20×0.12	3.62	16.4	315	291	302	285	4272	12	2.71	0.92	2.76	4.5	
ESO 568-023	10 40 22.7	-20 27 20	Sd	1.14×0.13	4.67	23.1	227	170	216	166	3553	17	3.05	1.07	3.05	5.0	
UGC 5844	10 41 10.0	+28 24 45	Sd	1.66×0.28	2.64	13.2	173	155	164	152	1467	10	1.88	0.63	1.96	5.0	
FGC 1130	10 42 47.3	-08 35 17	Sd	1.61×0.10	2.88	23.2	340	304	326	297	4989	8	5.17	0.85	5.18	8.1	
ESO 569-003	10 42 56.4	-22 23 52	Sdm	1.59×0.22	3.64	39.2	251	225	239	220	3737	5	7.27	0.99	7.66	10.8	*
UGC 5879	10 43 45.9	+60 10 46	Sd	1.81×0.13	3.19	27.6	308	283	294	276	5612	7	5.38	0.88	5.45	8.7	
ESO 438-002	11 03 18.0	-31 11 25	Sd	1.31×0.09	2.51	22.2	176	161	165	157	3718	5	3.04	0.58	3.06	8.8	
FGC 1195	11 03 51.2	-05 04 33	Sdm	1.44×0.18	2.75	19.4	329	290	312	281	7554	10	4.55	0.84	4.75	7.0	
ESO 377-007*	11 04 05.4	-36 25 37	Sd	1.77×0.22	4.48	42.1	302	149	291	146	2749	15	7.57	1.20	7.86	9.4	p,*
FGC 1204*	11 08 56.4	+45 36 53	Sd	1.05×0.11	3.35	11.0	246	223	232	216	7025	16	1.88	0.87	1.88	3.3	*
ESO 502-024	11 10 11.6	-23 11 23	Sdm	1.23×0.17	3.08	24.1	93	63	84	61	1177	8	1.73	0.52	1.74	7.8	d
UGC 6268	11 11 50.8	+22 45 36	Sd	1.34×0.13	2.93	20.1	≥170	≥161	≥159	≥156	5202:	...	≥1.85	0.56	≥1.90	6.9	e
FGC 1227	11 16 21.9	+61 47 49	Sd	1.19×0.08	4.12	10.6	227	200	215	195	4715	23	1.76	1.06	1.76	2.6	*
UGC 6384	11 19 16.3	+35 13 20	Sd	1.46×0.10	3.53	24.1	193	166	183	163	2035	8	3.08	0.79	3.13	6.8	
UGC 6454	11 24 37.2	+38 56 22	Sd	1.88×0.17	3.34	25.6	286	265	272	257	6348	7	3.42	0.77	3.50	7.7	a
UGC 6519	11 29 36.4	+01 28 57	Sd	1.32×0.13	3.10	9.6	291:	281:	278	274	5855	10	1.16:	0.62	1.20	3.1	n,*
FGC 1272	11 31 06.9	-15 29 36	Sd	1.46×0.12	2.79	23.8	297	283	285	278	3657	5	5.17	0.82	5.29	8.5	
FGC 1282*a	11 32 56.5	+25 14 18	Sd	1.10×0.10	2.88	16.6	366	335	349	325	6943	10	3.03	0.71	...	5.8	*
FGC 1282*b	...	...	...	...	3.23	12.4	513	498	489	480	9605	8	3.12	0.77	...	5.2	*
UGC 6679	11 40 24.4	+41 06 37	Sd	1.49×0.18	4.09	33.9	338	326	324	318	5172	9	2.82	0.95	2.94	4.3	
FGC 1305	11 43 43.5	-02 54 11	Sd	1.46×0.12	3.30	23.0	281	259	268	252	5246	8	4.40	0.91	4.41	7.0	
UGC 6862	11 50 39.5	+11 55 17	Sdm	1.37×0.15	3.65	16.2	227	163	216	159	2745	20	2.38	0.88	2.47	4.4	
FGC 1348*a	11 58 43.6	+31 33 15	Sd	1.12×0.10	3.66	11.2	206	197	196	193	2668	11	1.22	0.76	...	3.1	*
FGC 1348*b	...	...	...	...	3.92	13.2	271	253	258	246	6943	14	2.05	0.97	...	3.4	*
UGCA 266	11 59 52.2	-14 15 32	Im	1.04×0.44	4.09	30.9	104	80	95	78	1491	7	2.49	0.73	0.73	7.6	d,*
UGC 7170	12 08 04	+19 06 05	Scd	3.25×0.28	3.30	101.8	235	215	224	211	2456	2	15.21	0.80	15.36	30.8	
FGC 1384	12 10 26.9	+07 34 31	Sdm	0.73×0.10	2.89	13.0	196	186	186	183	2197	8	1.46	0.61	1.47	4.5	
FGC 1394*	12 13 21.8	+52 24 11	Sd	1.06×0.11	4.80	18.9	172	165	161	161	3487	8	2.63	1.12	2.67	3.9	*
FGC 1412	12 16 52.0	+00 29 36	Sdm	0.95×0.12	3.40	27.0	92	65	83	63	862	7	1.94	0.57	1.94	7.9	d
FGC 1419	12 20 16.1	-16 00 54	Sd	1.70×0.10	2.18	18.9	461	404	443	393	6533	10	4.79	0.69	5.08	8.7	
FGC 1434	12 23 31.9	+26 04 19	Sd	1.06×0.15	2.65	11.5	268	212	255	206	6932	18	1.48	0.55	1.51	4.3	
UGC 7618	12 26 48.0	+58 11 22	Sd	1.34×0.16	4.11	20.4	278	246	265	240	4709	13	3.80	1.12	3.87	5.0	p

Table 1. continued

Galaxy Name (1)	α (B1950.0) (2)	δ (B1950.0) (3)	Type (4)	$a \times b$ (5)	rms (6)	F_{max} (7)	W_{20}^{c} (8)	W_{50}^{c} (9)	$W_{20, \text{c}}$ (10)	$W_{50, \text{c}}$ (11)	V_{h} (12)	$\sigma(V)$ (13)	S (14)	$\sigma(S)$ (15)	S_{c} (16)	S/N (17)	Notes (18)
FGC 1464	12 32 31.5	+36 20 06	Sd	1.18×0.09	1.78	5.0	330:	295:	311	284	9967:	24	≥0.89	0.47	≥0.89	2.8	e
FGC 1475	12 34 21.1	+01 53 16	Sdm	1.01×0.12	2.87	13.8	113	96	104	94	591	10	1.24	0.54	1.24	4.8	d
UGC 7844	12 38 56.5	+73 59 27	Sd	1.27×0.16	6.03	15.6	227:	173:	217	170	1863	27	2.27:	1.34	2.27	3.0	*
FGC 1496	12 41 45.1	-05 15 34	Sdm	2.02×0.12	2.09	49.2	216	197	205	193	2672	3	7.92	0.55	8.26	22.7	*
FGC 1497	12 44 35.2	+32 55 21	Sdm	1.46×0.18	2.39	16.4	101	91	92	89	519	5	1.26	0.42	1.31	6.8	d
FGC 1519	12 51 47.9	-09 56 34	Sdm	1.12×0.11	2.81	14.0	202	193	191	188	3821	2.12	0.62	2.16	5.5	*	
ESO 575-026	12 52 58.4	-22 14 57	Sd	1.43×0.20	2.78	8.9	459	447	437	432	8781	12	2.23	0.87	2.25	3.2	
FGC 1529	12 55 50.1	-08 46 05	Sd	1.40×0.11	3.08	21.6	246	224	234	219	3873	8	3.74	0.81	3.90	7.0	
FGC 1530	12 56 03.0	+01 58 35	Sdm	1.01×0.11	2.29	11.4	39	104	104	37	2801	12	1.48	0.40	1.48	8.3	d, *
FGC 1543	13 00 47.6	+55 58 04	Sm	0.93×0.12	4.42	42.9	114	103	105	100	1366	4	4.13	0.86	4.18	9.7	
FGC 1587	13 14 18.7	+26 23 41	Sd	0.96×0.09	4.27	18.8	175	95	164	92	3964	23	2.16	0.91	2.20	4.4	p
FGC 1592	13 16 18.2	-05 31 48	Sd	1.27×0.11	3.97	21.6	247	220	234	214	5690	11	4.14	1.09	4.16	5.4	
ESO 508-065	13 21 01.3	-22 55 09	Sdm	1.51×0.20	2.99	15.8	225	204	213	199	4767	10	2.38	0.73	2.48	5.3	
UGC 8442	13 23 42.3	+22 11 44	Sd	1.06×0.12	3.11	13.1	374:	337:	355	326	8448	16	2.03:	0.77	2.06	4.2	n
FGC 1633	13 31 03.6	-10 58 57	Sdm	0.85×0.09	3.79	21.5	214	172	202	168	4177	13	3.07	0.90	3.11	5.6	*
FGC 1642	13 33 32.4	+08 26 33	Sd	1.21×0.13	3.38	24.5	161	99	152	96	1268	12	2.32	0.65	2.35	7.2	
UGC 8590	13 35 52.8	+37 20 52	Sd	1.76×0.12	3.90	14.6	415:	370:	396	359	7570:	20	2.01:	0.91	2.07	3.7	*
ESO 577-038	13 45 42.9	-18 37 43	Sd	1.38×0.11	3.15	76.8	149	130	139	127	1888	2	8.98	0.68	8.98	24.4	
FGC 1699	13 58 14.9	-16 22 34	Scd	1.22×0.10	4.21	12.5	393	366	372	353	9524	20	2.36	1.15	2.36	3.0	
FGC 1717	14 07 32.7	+20 32 45	Sdm	0.90×0.10	3.14	24.1	149	130	139	127	2296	6	2.64	0.65	2.68	7.7	
UGC 9066	14 08 12.0	+46 40 18	Sd	1.34×0.12	2.71	8.9	341	273	324	264	7903	28	1.53	0.71	1.56	3.3	
FGC 1731	14 11 57.8	-04 11 05	Sd	0.76×0.08	3.10	75.3	179	174	169	170	2689	1.07	9.64	0.70	9.73	24.3	
ESO 447-005	14 24 34.7	-31 00 49	Sd	1.23×0.11	2.96	15.1	370:	273	353	265	7128	22	3.19	0.86	3.27	5.1	p
UGC 9377	14 31 53.8	+44 17 52	Sd	1.11×0.12	4.04	10.1	124:	114	114	111	3051	15	1.18:	0.87	1.18	2.5	i,n,*
FGC 1775	14 34 52.4	+49 37 40	Sm	0.72×0.10	3.74	19.8	92	72	83	69	2247	10	1.27	0.60	1.27	5.3	d
UGC 9478	14 39 58.0	+85 30 47	Sd	1.24×0.10	8.21	30.6	468	396	450	386	6163	26	6.77	2.43	6.78	3.7	
FGC 1809	14 45 15.7	+79 58 25	Sd	0.92×0.10	6.26	26.8	149	141	139	138	2192	7	3.73	1.47	3.73	4.3	n
UGC 9605	14 53 34.1	+48 34 01	Sd	1.39×0.12	3.81	14.6	248	218	237	214	3426	16	2.38	0.97	2.44	3.8	
FGC 1830	14 54 03.2	+83 30 17	Sd	1.00×0.08	6.09	21.0	365:	144:	354	141	1816:	48	4.12:	1.70	4.19	3.4	n,p
FGC 1838	14 55 17.5	+38 49 52	Sdm	0.84×0.11	3.87	14.6	228	220	213	211	9445	9	1.59	0.80	1.60	3.8	
FGC 1842	14 58 40.6	+38 12 24	Sd	0.78×0.10	3.28	13.5	174:	130:	165	127	2388	17	1.37:	0.60	1.38	4.1	p
FGC 1845	15 00 10.0	-13 07 51	Sdm	1.46×0.11	3.13	28.8	194	174	184	170	2515	6	3.46	0.68	3.49	9.2	*
FGC 1854	15 03 50.1	-12 31 30	Sdm	1.34×0.10	2.79	44.4	181	165	171	162	2331	3	6.47	0.67	6.65	13.9	
FGC 1895	15 22 54.4	-17 04 00	Sdm	0.93×0.12	2.61	13.7	351	330	334	320	7072	10	2.43	0.69	2.48	5.2	*
FGC 1899	15 23 59.1	-13 47 32	Sd	0.88×0.09	2.97	22.6	236	227	222	220	7430	5	4.18	0.80	4.23	7.6	
FGC 1906	15 26 46.6	+49 17 39	Sd	0.87×0.09	2.55	15.9	258	251	243	243	7542	5	2.45	0.63	2.48	6.2	
FGC 1917	15 32 32.6	+34 09 19	Sd	0.91×0.07	3.44	7.5	370	294	350	283	9492	45	1.53	0.98	1.54	2.2	
FGC 1931	15 37 42.5	+46 59 25	Sd	0.76×0.08	4.43	15.4	294	224	279	217	6454	27	2.67	1.16	2.67	3.5	n,*
FGC 1939	15 40 13.5	-13 47 48	Sd	0.78×0.09	3.77	10.7	328	271	318	268	882	30	1.74:	0.96	1.74	2.88	b
UGC 10004	15 42 34.3	+47 27 05	Sd	1.02×0.08	3.21	11.1	294:	269:	280	262	5929	16	2.25:	0.91	2.25	3.5	b, *
FGCE 1224	15 43 40.5	-20 58 06	Scd	1.29×0.10	3.07	15.8	316	261	301	253	6574	16	3.72	0.94	3.77	5.2	
FGC 1951	15 44 25.6	+88 38 12	Scd	1.10×0.13	9.05	23.7	434:	427:	417	417	5615:	12	5.51:	2.75	5.64	2.6	n
UGC 10369*a	16 21 42.4	+67 24 42	Sdm	1.24×0.17	7.84	52.5	176	158	168	156	998	7	7.19	1.67	...	6.7	*
UGC 10369*b	...	...	...	...	4.97	33.6	190	160	176	154	8433	9	2.99	0.93	...	6.8	*
FGC 2068	16 45 00.0	+31 58 19	Sd	1.12×0.11	3.03	17.0	232	200	220	195	4428	11	2.50	0.73	2.56	5.6	
UGC 11188	18 15 20.0	+18 52 50	Sd	1.28×0.16	4.18	12.9	≥178	≥172	≥166	≥167	5215:	9	≥1.36	0.56	≥1.40	3.1	e
UGC 11243	18 26 00.0	+22 40 42	Sd	1.23×0.11	4.62	15.0	396:	299	382	293	4357	34	2.44:	1.17	2.45	3.2	c,n,*
FGC 2247	19 19 56.8	+54 42 56	Sd	1.16×0.08	3.20	14.5	400:	281:	386	275	4488	27	2.76	0.88	2.77	4.5	
UGC 11433	19 21 59.3	+34 41 40	Sd	1.05×0.10	8.4	23.0	195:	173:	188	170	2945	14	2.05:	1.16	...	2.7	i,G
FGC 2264	19 47 00.6	-10 54 02	Sd	1.29×0.09	3.84	20.5	≤320	≤311	≤305	≤303	6008:	6	≤4.25	1.10	≤4.35	5.3	c,*

Table 1. continued

Galaxy Name (1)	α (B1950.0) (2)	δ (B1950.0) (3)	Type (4)	$a \times b$ (5)	rms (6)	$F_{\max}$ (7)	W_{20} (8)	W_{50} (9)	$W_{20,c}$ (10)	$W_{50,c}$ (11)	V_h (12)	$\sigma(V)$ (13)	S (14)	$\sigma(S)$ (15)	S_c (16)	S/N (17)	Notes (18)
FGC 2265	19 59 53.6	+52 56 06	Scd	1.39×0.17	4.46	34.6	224	210	213	206	3523	6	5.33	1.10	5.55	7.8	
FGC 2277	20 32 20.8	-07 47 30	Sd	0.93×0.11	3.70	17.3	245	146	233	142	3647	24	2.16	0.82	2.16	4.7	*
FGC 2280	20 35 11.0	-03 21 43	Scd	1.30×0.17	4.02	17.3	466	426	449	416	6260	15	3.22	1.00	3.33	4.3	p
FGC 2286	20 40 07.1	-02 56 41	Sd	1.56×0.12	2.70	17.6	350	256	337	251	3825	17	3.23	0.73	3.31	6.5	n
FGC 2299 ^a	20 58 28.6	-17 19 47	Sdm	1.04×0.13	4.48	11.8	288	196	276	192	3463	41	1.84	1.11	...	2.6	n, *
FGC 2299 ^b	...	...	...	...	3.02	17.2	222	208	210	202	6222	7	2.33	0.64	...	5.7	p, *
UGC 11666a	20 59 54.3	+14 56 10	Sdm	1.01×0.11	2.44	10.4	252	205	239	199	5317	18	1.44	0.57	1.44	4.3	*
FGC 2303	21 01 00.7	-17 58 08	Sd	0.71×0.07	6.12	19.7	91	68	81	65	3132	17	1.30	1.27	1.31	3.2	d, *
ESO 342-017	21 09 02.1	-37 50 01	Sd	1.66×0.09	5.17	11.9	299	256	283	248	7737	32	1.64	1.21	1.71	2.3	*
FGC 2323	21 21 23.5	+18 54 48	Sd	0.80×0.10	2.75	11.0	238	180	225	175	5370	22	1.27	0.59	1.28	4.0	b, n, *
FGC 2339	21 42 01.0	-06 55 20	Sd	2.06×0.11	4.15	37.7	209	197	198	193	3098	4	5.83	1.03	5.84	9.1	
FGC 2349	21 50 13.6	+03 18 31	Sd	0.99×0.10	3.54	10.1	364	285	346	275	8233	35	1.72	0.92	1.75	2.8	b
UGC 11838	21 50 21.2	+28 04 11	Sd	0.99×0.10	3.0	32.9	277	248	267	243	3476	5	5.84	0.72	5.86	11.0	
UGC 11876	21 59 56.4	+02 35 23	Sd	1.14×0.10	3.02	16.5	279	251	267	246	3984	11	2.96	0.80	2.99	5.5	
FGCE 1693	22 02 34.4	-20 51 22	Sd	0.99×0.10	4.83	17.5	119	117	109	114	2755	4	1.76	0.96	1.77	3.6	
FGC 2366	22 05 23.4	-10 34 36	Sd	2.16×0.10	4.36	40.6	205	192	194	188	2866	4	5.68	1.02	5.93	9.3	
ESO 532-032	22 10 05.2	-25 53 26	Sdm	2.04×0.20	3.73	43.8	148	134	138	131	2657	4	4.73	0.77	5.10	11.7	
ESO 344-017	22 12 17.0	-37 34 12	Irr	1.3×0.2	3.53	37.0	237	217	226	212	3357	5	6.33	0.92	6.33	10.4	
UGC 11999	22 19 42.6	+42 41 49	Sdm	0.86×0.11	3.30	20.1	249	174	238	170	3298	16	2.55	0.74	2.58	6.1	p
FGC 2388	22 21 22.2	+06 38 10	Sdm	0.77×0.10	2.49	10.7	223	140	211	136	4790	24	1.57	0.61	1.59	4.3	
ESO 467-063	22 24 33.1	-31 15 50	Sd	1.37×0.11	3.94	22.8	177	153	166	149	3933	10	3.07	0.91	3.18	5.8	*
FGC 2392	22 25 02.8	-07 58 23	Sd	0.96×0.10	2.22	9.9	81	66	71	62	7234	10	0.62	0.35	0.62	4.4	a, p
FGC 2394	22 31 54.0	+72 13 14	Sdm	1.62×0.22	4.77	42.0	292	278	281	274	2597	5	7.42	1.26	7.44	8.8	
FGCE 1776	22 43 19.6	-37 18 25	Sd	0.90×0.11	3.38	10.0	363	343	346	334	6673	17	2.34	1.03	2.37	2.9	b, n
FGC 2420	22 46 01.9	+75 29 18	Sdm	0.93×0.11	4.19	18.9	134	119	125	116	1551	10	2.00	0.86	2.00	4.5	
FGC 2458	23 04 03.6	+05 50 48	Sd	1.21×0.10	3.72	26.0	280	251	266	244	5948	9	3.86	0.90	3.86	7.0	
FGC 2468 ^a	23 10 29.2	-01 30 52	Sd	1.03×0.10	3.18	12.7	163	89	151	85	6270	24	1.27	0.63	...	4.0	d, *
FGC 2468 ^b	...	...	...	...	3.18	15.1	374	245	356	237	7995	27	3.01	0.90	...	4.7	p, *
FGC 2475	23 11 46.0	+34 01 36	Sd	1.03×0.11	2.39	9.5	212	192	200	187	5215	13	1.11	0.51	1.11	4.0	e
FGC 2495	23 21 23.6	+09 32 26	Sd	1.03×0.10	6.20	20.2	312	213	295	205	8542	34	3.76	1.68	3.81	3.3	*
FGC 2498	23 22 08.3	-03 03 50	Sdm	0.96×0.09	4.20	19.9	148	119	138	116	2545	13	1.97	0.83	2.00	4.7	
UGC 12659	23 30 10.0	-02 03 37	Sd	1.52×0.15	3.84	16.8	316	295	303	288	5255	12	2.38	0.84	2.49	4.3	p, *
ESO 605-015	23 34 00.2	-22 08 19	Sd	2.13×0.20	3.90	49.0	134	109	125	106	1555	4	5.42	0.82	5.91	12.6	
FGC 2523	23 37 49.9	-07 02 29	Sd	1.03×0.07	2.47	23.7	228	207	214	200	6802	5	3.68	0.61	3.68	9.6	
FGC 2536	23 45 25.3	+27 51 05	Sd	1.48×0.09	3.94	12.9	405	343	384	331	9236	27	2.46	1.08	2.48	3.3	
UGC 12814	23 48 50.4	+48 48 01	Sd	1.27×0.15	4.41	16.1	457	410	440	400	5838	21	3.80	1.35	3.93	3.6	n
FGC 2548	23 49 47.7	+07 41 54	Sd	1.01×0.09	3.96	19.7	214	158	203	154	3885	17	2.90	0.95	2.95	5.0	*
FGC 2558	23 52 46.1	+03 32 38	Sd	1.01×0.10	2.59	14.5	206	184	194	179	5374	9	2.17	0.63	2.20	5.6	
ESO 293-020	23 54 20.6	-38 56 27	Sb	2.35×0.22	10.7	36.0	210	161	202	157	4630	17	4.10	1.64	4.32	3.4	e, G

2. Goals and target selection

2.1. A pilot FGC survey

In May 1996, we began using the Nançay Radio Telescope to undertake a pilot survey aimed at measuring redshifts and HI parameters for a modest sample of galaxies selected from the FGC. Our preliminary sample consisted of 57 galaxies lying in the declination range accessible at Nançay ($\delta \geq -38^\circ$) and without published redshifts and/or HI flux and linewidth measurements.

A primary goal of our pilot survey was to find new examples of underevolved “extreme late-type” spirals in the local universe ($V_h \lesssim 5000 \text{ km s}^{-1}$). As shown by Matthews (1998), galaxies at the end of the spiral sequence possessing moderate-to-low surface brightness, optically-organized disks with little or no bulge component are often extremely gas-rich systems ($\frac{M_{\text{HI}}}{L_V} \geq 1$). The faintest of these galaxies are often found to rotate faster than predicted by the standard Tully-Fisher relation (see also Matthews et al. 1998b), and appear to have evolved minimally in both a dynamical and in a star-formation sense over a Hubble time (see also Matthews & Gallagher 1997). The relative simplicity of such objects compared with giant spirals makes them suitable for investigations of the factors that govern various aspects of disk structure and evolution in all spirals. Extreme late-type spirals with superthin morphologies are of particular interest due to their minimal dynamical heating and their requirement of massive dark halos for stability (e.g., Zasov et al. 1991; Matthews 1998). This makes the FGC an excellent source for new examples of nearby extreme late-type spirals.

For our pilot survey we preferentially selected targets with large angular sizes ($D_{25} > 1'$), very late-type Hubble classifications (Scd or later), and luminosity classes of III or IV (i.e. low optical surface brightness systems). Our selection criteria were imposed in order to maximize the likelihood that our targets would be relatively small, gas-rich, low-luminosity spirals (i.e., extreme late-type spirals) within in the local universe, rather than more distant, more luminous objects (see also Gallagher et al. 1995; Matthews et al. 1995; Matthews & Gallagher 1996).

2.2. An extended survey of pure disk spirals

Because the detection rate during our pilot survey was so high, in August 1996 we began a second phase of our survey program by significantly expanding our target list and extending our velocity search range for most of the undetected objects from the pilot survey. Our new goals included not only disk evolution studies and a continued search for interesting individual objects, but also to produce a more extensive database of HI properties suitable for: (1) exploring the diversity of galaxy properties within

the FGC; (2) providing global parameters for a statistical sample of pure disk galaxies; (3) undertaking Tully-Fisher analyses of the lowest-luminosity pure disks spirals (cf. Matthews et al. 1998b); (4) better assessing the contribution of late-type disks to the local HI luminosity function; (5) exploring the 3-D spatial distribution of pure disk galaxies.

For the second phase of our survey we culled from the FGC a list of 380 additional targets for observation from Nançay. We included most of the remaining galaxies in the FGC meeting our initial selection criteria, but this time we also selected a number of galaxies with $D_{25} \leq 1'$ or luminosity class II, as well as a few large angular size objects with earlier Hubble classifications, and a handful of galaxies with $D_{25} > 1'$ from the addendum to the FGC (the FGCA)¹. Added to this target list were ~ 20 galaxies culled from the Lyon-Meudon Extragalactic Database (LEDA) with $a/b \geq 7$, $D_{25} \geq 1'$, Hubble type Scd or later, and no catalogued redshift, but which had not been included in the FGC. Finally, we compiled from the southern extension of the FGC (the FGCE) a list of high-priority targets in the declination range $-44.5^\circ \leq \delta \leq -38^\circ$ (i.e., south of the Nançay declination limit) for observation with the Green Bank 140-ft telescope (see below).

3. Observations

3.1. The Nançay observations

In total, new observations of 437 flat galaxy candidates were undertaken using the Nançay Decimetric Radio Telescope and 1024-channel autocorrelator spectrometer between May 1996 and January 1999.

The Nançay telescope is a meridian transit-type instrument with an effective collecting area of roughly 7000 m^2 . At 21-cm, the FWHP beam size is $3'6'' \text{ E-W} \times \geq 22'0'' \text{ N-S}$. Because of the design of the Nançay telescope, the N–S beam diameter changes as a function of the declination of the source (see Fig. 1).

Observations were obtained in total power mode, using consecutive pairs of two-minute on-source and two-minute off-source integrations. Off-source integrations were generally taken $\sim 20'$ E of the target position. Tracking was limited to 0.75 – 3.0 hours per source per day. Due to scheduling constraints, total integration times for each target varied, but were typically a few hours per galaxy. Typically system temperatures were $\sim 40 \text{ K}$.

Two different autocorrelator configurations were used to obtain the Nançay spectra. The bulk of the observations were obtained in a single (horizontal) polarization mode,

¹ The FGCA is a compilation of nearly edge-on disk galaxies catalogued by Karachentsev et al. (1993) but which were subsequently excluded from the FGC because they did not meet the disk axial ratio cutoff criterion of $a/b \geq 7$.

Fig. 2. HI spectra of the galaxies detected in the present survey. Axes are flux density, in millijanskys, versus radial velocity, in kilometers per second, using the optical convention. Boxcar smoothing has been applied to the spectra for display purposes only

Fig. 2. continued

Fig. 2. continued

Fig. 2. continued

Fig. 2. continued

Fig. 2. continued

Fig. 2. continued

Fig. 2. continued

Fig. 2. continued

Fig. 2. continued

with the autocorrelator divided into four banks of 256 channels each and a small overlap in frequency between consecutive banks. The total bandpass was ~ 23 MHz, yielding a channel spacing of ~ 5.3 km s $^{-1}$, for an effective resolution of ~ 6.3 km s $^{-1}$. Galaxies observed with this set-up were initially observed over a search range from 341 – 5299 km s $^{-1}$. Most targets were also observed over higher-velocity search ranges, typically from 5023 – 10138 km s $^{-1}$. For a small number of targets, observations were obtained with a bandpass of ~ 12 MHz and channel spacings of ~ 2.6 km s $^{-1}$. In these cases the effective search ranges were 324 – 2900 km s $^{-1}$ or 5006 – 7664 km s $^{-1}$.

3.1.1. Reduction and analysis of the Nançay data

Our Nançay spectra were reduced using the SIR spectral line reduction packages available at the Nançay site. With this software we fitted and subtracted baselines (third-order or lower polynomials) and applied a declination-dependent conversion factor to convert from units of T_{sys} to flux density in millijanskys. The T_{sys} -to-mJy conversion factor is determined through regular monitoring of strong continuum sources by the Nançay staff. This procedure yields a relative calibration accuracy of $\sim 15\%$. In addition, we applied a scaling factor of 1.26 to all Nançay spectra to derive our absolute flux scale (see Matthews et al. 1998a).

Peak fluxes, integrated fluxes, velocity widths, and radial velocities were measured for all detected sources using IDL software written by one of us. Our measured parameters are presented in Table 1. Spectra of all the detected galaxies are presented in Fig. 2.

In order to increase signal-to-noise to a level suitable for high-quality measurements, in most cases we smoothed the data to a resolution of ~ 16 km s $^{-1}$ before performing the line measurements. In general smoothing permits a better determination of the systemic velocity, although it results in a systematic overestimation in the measured linewidths (see e.g., Giovanelli et al. 1997). For this reason, we have derived a correction to our measured linewidths to account for instrumental resolution and smoothing (see below).

We determined peak fluxes in the detected lines using the mean of the two strongest channels, after smoothing. Velocity widths were measured interactively, by moving the cursor outward from the profile center. Radial velocities were defined to be the centroid of the two 20% peak maximum points on the line profile. Total fluxes were measured by integrating the area under the line profile on the baseline-subtracted spectrum.

In a number of observations obtained at Nançay during January 1997 spurious features with velocity widths of ~ 200 – 300 km s $^{-1}$ intermittently appeared in our spectra near $V_h \sim 1300$ km s $^{-1}$. Their cause is unknown. These

features generally had intensities of a few tens of millijanskys, and thus mimicked the appearance of a real extragalactic source. As a result, we generally treat apparent detections near $V_h \approx 1300$ km s $^{-1}$ as marginal unless they were subsequently confirmed by independent observations (see Notes to Tables 1 & 2 in Appendices A & B).

3.2. The Green Bank observations

Observations of 54 FGC targets were carried out in October 1997 using the NRAO² 140-ft telescope located in Green Bank, West Virginia. The primary goal of the Green Bank observations was to observe high-priority FGCE targets (e.g., objects of large angular size) located between declinations -38° and -44.5° (i.e., which were too far south to be observed at Nançay) or which otherwise could not be observed at Nançay due to scheduling constraints. In addition, we observed at Green Bank a few sources that we had previously detected at Nançay in order to provide an external check on flux calibration.

Observations at Green Bank were carried out using the 1.3 – 1.8 GHz receiver and Mark IV 1024-channel autocorrelator spectrometer. The autocorrelator was divided into two orthogonally polarized banks of 512 channels, each with a 20 MHz total bandpass, but with center velocities offset by ~ 500 km s $^{-1}$. Typically, search ranges were approximately 600 – 4700 km s $^{-1}$ and 1100 – 5200 km s $^{-1}$ in the respective banks, although a few targets were observed over slightly different velocity ranges (see Table 3). Channel widths were ~ 8.4 km s $^{-1}$, for an effective velocity resolution of ~ 10 km s $^{-1}$.

Observations were obtained in total power mode using a series of six-minute on-, and six-minute off-source integrations. The off-source observations were obtained at locations offset $6^m 42^s$ west of the target position. Total integration times were typically 1.25 hours per source. Observations were made after sunset to avoid solar interference in the sidelobes. At 1400 MHz, the 140-ft telescope has a FWHP beamwidth of $\sim 21'$. System temperatures ranged from 18 K for observations near zenith, to 28 – 35 K for observations at $\delta < -40^\circ$. Absolute flux calibration was accomplished through the monitoring of both line calibrators (from Davies et al. 1989 and van Zee et al. 1997) and continuum calibration sources (selected from the VLA Calibration Manual³) several times per night. These two methods generally agreed to within better than 5%. The mean derived calibration factor varied by $\sim \pm 3.5\%$ over the course of 8 nights.

Unfortunately our Green Bank run was plagued by recurrent radio frequency interference (RFI) at a range

² The National Radio Astronomy Observatory (NRAO) is a facility of the National Science Foundation operated under cooperative agreement by Associated Universities, Inc.

³ The VLA Calibration Manual is available on the World Wide Web at www.nrao.edu/~gtaylor/calib.html

Table 2. Marginal and questionable detections

Galaxy Name	α (B1950.0)	δ (B1950.0)	Type	$a \times b$	rms	F_{max}	W_{20}	W_{50}	V_h	$\sigma(V)$	S	$\sigma(S)$	S/N	Notes
ESO 243-016	00 55 01.8	-42 56 24	Scd	1.29×0.11	12.8	29	239	192	3985	12	2.9	1.8	2.3	G
FGCE 124	01 03 37.9	-19 08 17	Sd	0.71×0.09	3.43	9.4	180	146	7625	24	0.88	0.66	2.8	
UGC 778	01 11 25.5	+49 57 39	Sd	1.10×0.11	3.34	11	266	224	6867	22	1.4	0.7	3.3	
FGC 242*a	02 03 33.2	+30 52 50	Sd	1.03×0.11	3.92	12	172	166	3891	10	1.2	0.8	3.1	*
FGC 242*b	...	...	...	...	3.69	11	142	126	6051	15	0.79	0.62	3.0	*
FGC 284	02 20 04.6	+17 35 17	Sd	1.01×0.10	7.5	35	222	200	4128	8	4.2	1.2	4.7	G,*
FGC 392	03 08 28.4	+34 49 59	Sd	1.18×0.11	3.81	9.9	310	231	4566	-	1.3	0.9	2.6	
FGCE 454	04 59 29.6	-22 19 37	Sd	0.65×0.09	3.00	8.0	289	275	1385	16	1.3	0.8	2.7	
FGC 511	04 49 26.2	-06 01 51	Sd	0.83×0.08	3.99	21	166	124	2749	14	2.3	0.8	5.2	d,*
FGCE 527	05 44 08.4	-17 24 10	Sd	1.19×0.12	3.42	6.7	172	152	5738	26	0.74	0.71	2.0	
FGCE 554	06 00 41.0	-28 04 07	Sd	0.76×0.08	2.96	6.1	118	93	6417	27	0.56	0.56	2.1	
FGC 567	06 24 31.2	+56 13 32	Sd	1.10×0.10	2.92	8.5	284	201	5293	35	1.3	0.7	2.9	*
FGC 598	07 03 28.6	+44 44 36	Sd	0.95×0.11	2.76	12	239	181	5867	20	1.8	0.7	4.2	*
UGC 3716*	07 06 58.0	+39 47 13	Sd	0.91×0.10	2.34	16	398	312	6359	15	3.4	0.7	6.8	c,p,*
FGC 613	07 13 20.5	+33 02 37	Scd	1.03×0.13	4.12	11	186	173	6392	15	1.1	0.8	2.6	*
FGC 647	07 36 35.6	+62 45 55	Sd	0.83×0.10	3.88	9.9	314	155	6577	55	1.3	0.9	2.6	
UGC 4068	07 49 33.4	+40 18 14	Sd	1.48×0.18	2.35	4.9	159	138	8263	25	0.54	0.49	2.1	
FGC 781	08 37 46.8	+57 49 27	Sd	0.72×0.09	5.38	12	119	97	2340	24	1.1	1.0	2.2	
FGC 904	09 29 32.5	-16 27 05	Sd	1.49×0.12	2.90	20	287	261	2180	8	3.8	0.8	6.9	c,p,*
FGCE 768*a	09 41 49.0	-24 58 20	Sd	0.86×0.12	4.05	11	174	111	2504	32	1.1	0.8	2.8	
FGCE 768*b	...	...	...	...	4.05	9.4	202	190	3775	17	1.4	1.0	2.3	
ESO 498-023	09 42 15.4	-23 43 21	Sd	1.12×0.11	3.07	8.6	242	182	5778	31	0.97	0.65	2.8	
UGC 5550	10 14 03.7	+64 38 19	Sdm	1.01×0.10	5.47	14	237	199	4507	27	1.7	1.2	2.5	*
FGC 1136	10 46 04.6	+19 24 05	Sd	0.90×0.10	4.37	14	71	57	1856	12	0.67	0.55	3.2	
FGC 1248	11 24 22.8	+70 45 15	Sd	0.92×0.11	3.86	11	260	251	6934	12	1.6	1.0	2.8	b,*
FGC 1359	12 02 32.4	-03 35 52	Sd	1.01×0.13	2.84	6.4	278	236	5712	33	1.1	0.7	2.2	*
UGC 7553*	12 24 29.6	-01 14 27	Sdpec	1.18×0.11	2.11	12	371	332	8820	13	2.3	0.6	5.5	c,*
FGC 1563	13 05 36.3	-15 58 19	Sdm	0.95×0.12	3.10	11	185	149	2790	19	1.1	0.6	3.5	i,*
ESO 576-047	13 21 28.8	-17 38 24	Sd	1.25×0.10	3.91	17	...	...	≥6801	...	...	...	4.4	e,*
UGC 8538	13 31 07.7	+46 05 33	Sd	1.41×0.11	4.14	21	≥133	≥116	1327	9	≥2.4	0.9	5.0	i,*
FGC 1647	13 35 47.3	+08 26 30	Sd	0.95×0.10	2.99	6.4	84	56	2662	28	0.51	0.53	2.1	
FGC 1660	13 41 07.0	+22 20 51	Sdm	1.08×0.10	3.09	9.6	320	275	8134	24	1.2	0.7	3.1	
FGC 1680	13 50 39.7	+68 37 15	Sdm	0.84×0.09	6.31	18	191	165	3865	20	1.6	1.2	2.8	
FGC 1793*a	14 38 25.6	-17 25 20	Sd	0.65×0.09	3.16	32	78	63	3422	4	2.2	0.5	10.3	*
FGC 1793*b	...	...	...	...	3.16	36	240	106	4140	11	5.0	0.7	11.5	*
ESO 580-019	14 42 50.6	-22 14 57	Sd	0.95×0.10	4.26	10	163	131	5638	-	0.96	0.82	2.4	
FGC 1865	15 12 02.2	+37 31 14	Sdm	0.95×0.10	2.78	10	246	235	8988	10	0.94	0.53	3.7	
FGC 1869	15 12 34.2	+06 06 52	Sdm	0.83×0.09	2.55	8.1	83	36	6870	24	0.48	0.39	3.2	
FGC 1903	15 25 07.1	+66 23 16	Sdm	0.93×0.11	4.56	33	207	146	3459	12	4.5	1.2	7.2	*
FGC 2028	16 20 17.5	+63 14 13	Sd	1.01×0.08	4.60	9.1	207	174	3075	33	1.4	1.1	2.0	
FGC E1446*	20 12 04.9	-20 00 23	Sd	0.73×0.07	4.68	22	234	225	4914	7	3.6	1.2	4.6	c,*
ESO 596-026	20 20 13.8	-21 21 14	Sd	1.03×0.11	1.83	7.2	285	...	8393	46	0.76	0.37	4.0	
ESO 342-044	21 22 36.3	-40 20 25	Scd	1.14×0.11	17.4	50	468	449	5034	12	12.6	4.0	2.9	G,*
ESO 407-012	23 12 27.5	-33 31 30	Irr	1.10×0.11	2.92	10	153	80	5999	27	0.65	0.46	3.5	*
FGC 2506	23 29 18.6	-01 06 05	Sdm	0.99×0.11	4.00	14	...	...	≥5200	...	...	...	...	e,*

of frequencies throughout our observed spectral range. Approximately 15% of our scans in both polarizations were affected. Most of the interference caused either high-amplitude ringing throughout a large fraction of the bandpass, or else produced strong, broad spectral features mimicking astronomical signals. Some of the interference was traced to on-site sources (which were located and eliminated), while other sources remained unidentified. Effects appeared to be most severe during observations of targets near the horizon.

In addition to the interference problems, during a night following a substantial rainfall, intermittent baseline structures occurred in a number of our spectra, which could not be removed by fitting sinusoids or low-order

polynomial baselines. As a result, a significant number of additional scans had to be discarded. In total, ~25% of our Green Bank scans were unusable due to interference and/or bandpass structure. As a result, the rms noise in our Green Bank spectra was typically $\gtrsim 3$ times higher than in our Nançay data.

3.2.1. Reduction and analysis of the Green Bank observations

The Green Bank data were reduced using the line version of the NRAO Unipops spectral analysis package. Baselines (typically first or second-order polynomials) were subtracted from individual scans and the scans for each object

were then averaged. Scans contaminated by significant interference or strong residual baseline structure were not included in the final averages. Peak fluxes, line widths, radial velocities, and integrated fluxes were measured for detected sources in the manner described for the Nançay data, but using routines written in Unipops. All measurements of the Green Bank data were performed on unsmoothed spectra.

4. The data

4.1. Derived HI parameters

Table 1 presents measured HI parameters for the galaxies detected during our Nançay and Green Bank observations, and the individual spectra are shown in Fig. 2. Criteria for inclusion in Table 1 were partly subjective—i.e., detections with high signal-to-noise and lacking definitive evidence for confusion were always included; however, weaker sources were also included if (1) a positive signal is visible over several consecutive channels and it has a linewidth and line profile shape expected for a real source, or (2) if the detection was corroborated by other workers. Such cases are discussed further in the Notes to Table 1 (Appendix A). Colons (:) following certain entries in Table 1 indicate measurements where the uncertainties may be larger than the formally computed errors.

The columns in Table 1 are defined as follows:

(1) Galaxy name, using the UGC number from Nilson (1973) or the ESO number from Lauberts & Valentijn (1989) if available, otherwise using the FGC number. The meaning of an asterisk (*), or the letters “a” and “b” appended to certain galaxy names are described in Sect. 4.2.

(2) & (3) Right ascension and declination of the optical centers of the targets, in epoch B1950.0, taken from the NED database. These were used as the pointing centers for the HI observations.

(4) Hubble type taken from the FGC when available, otherwise from the NED database.

(5) Galaxy major and minor axis diameters in arcminutes, taken from the NED database.

(6) Spectrum rms, in millijanskys.

(7) Peak flux in the line profile, in millijanskys.

(8) & (9) Raw, measured full width at 20% and 50% of the maximum profile height, respectively, in km s^{-1} . No correction has been applied to the raw linewidths for cosmological stretching, instrumental resolution, or in the case of the Nançay spectra, for the errors arising from describing equal frequency-width channels by a constant velocity width across the entire bandwidth of the spectrum. The

latter effect is inherent in the Nançay software, but is negligible compared with our measurement uncertainties.

(10) & (11) W_{20} and W_{50} values, corrected for cosmological stretching and spectral resolution, using the relation

$$W_{w,\text{cor}} = [W_{w,\text{raw}} + \delta_c] / (1 + z) \quad (1)$$

(see Haynes & Giovanelli 1994). Here $W_{w,\text{raw}}$ is the raw observed linewidth at $w = 20\%$ or $w = 50\%$ peak maximum, $z = V_h/c$, and δ_c is given by

$$\delta_c = (0.014\omega - 0.83)\delta_R \quad (2)$$

where $\omega = 20$ and $\omega = 50$ for W_{20} and W_{50} , respectively, and δ_R is the velocity resolution of the measured spectrum (see Bottinelli et al. 1990). No corrections were applied for inclination angle of the source or for turbulent motions.

(12) Heliocentric radial velocity, in km s^{-1} , quoted using the optical convention, $V_h = c(\nu_0 - \nu)/\nu$.

(13) Uncertainty in the heliocentric radial velocity, in km s^{-1} , computed using the prescription of Fouqué et al. (1990):

$$\sigma(V) = 4R^{0.5}P_W^{0.5}X^{-1} \quad (3)$$

where R is the spectral resolution in km s^{-1} , $P_W = (W_{20} - W_{50})/2$, and X is the signal-to-noise of the spectrum. We define signal-to-noise X as the ratio of the peak flux in the spectrum to the spectrum’s rms. According to Fouqué et al., errors in the measured linewidths may be estimated as $\sigma(W_{20}) \approx 3\sigma(V)$ and $\sigma(W_{50}) \approx 2\sigma(V)$.

(14) Raw, integrated HI flux, in Jy km s^{-1} , after application of an empirically-derived flux calibration scaling factor of 1.26 to the Nançay data (see Matthews et al. 1998a). No corrections have been applied for beam attenuation.

(15) Uncertainty in the integrated line flux, in Jy km s^{-1} , computed using the formula from Fouqué et al. (1990):

$$\sigma(S) = 5R^{0.5}S^{0.5}F_{\text{max}}^{0.5}X^{-1} \quad (4)$$

where F_{max} is the peak flux in the line profile in Jy, S is the raw integrated line flux in Jy km s^{-1} (taken from Col. 14), and the other parameters are as in Eq. (3).

(16) Corrected integrated line fluxes, in Jy km s^{-1} . For galaxies observed at Nançay, we have computed a correction to our observed fluxes for the finite size of the observing beam using the formula:

$$S_c = S \left[1 + \left(0.75 \frac{a_B \sin \beta}{\theta_{\text{EW}}} \right)^2 \right]^{\frac{1}{2}} \quad (5)$$

where S is the raw integrated HI line flux, a_B is blue major axis diameter of the galaxy, and θ_{EW} is the E–W FWHP of the telescope. Because the Nançay beam is elongated, a term is included to account for the position angle of the galaxy, β (as measured north to east; see Bottinelli et al. 1990). Our correction assumes a single-peaked Gaussian HI distribution and the empirically-established ratio of HI-to-optical diameter for late-type galaxies established by Fisher & Tully (1975). In addition, since our sample

consists entirely of nearly edge-on galaxies, we have assumed that the HI thickness along the minor axis is infinitely thin. A more general form of Eq. (5) applicable to galaxies with arbitrary inclination angles would contain an additional term to correct for the finite extent of the HI layer along the projected minor axis (see e.g., Bottinelli et al. 1990; Matthews et al. 1998a). Position angles used for computing the corrected Nançay fluxes were taken from the FGC, UGC or ESO catalogues. In cases where there are multiple entries in Table 1 for a single target, no corrected flux is given due to the ambiguity of the angular diameter and position angle corresponding to each of the HI sources. In most instances, the correction derived from Eq. (5) is small ($\lesssim 1\%$).

For galaxies observed at Green Bank, corrections for beam attenuation were negligible for the present sample. However, for objects observed at elevations $El \leq 15^\circ$, we applied a correction for atmospheric extinction estimated from Fig. 1 of van Zee et al. (1997).

(17) Signal-to-noise ratio of the detected line, defined as the ratio of the peak flux to the spectrum rms.

(18) Notes on individual sources. An asterisk in this column indicates a corresponding note can be found in Appendix A. Other symbols in Col. 18 denote the following:

- a: Highly asymmetric profile.
- b: Poor baseline.
- c: Detected line profile appears to be affected by confusion with a second source.
- d: Narrow, dwarf-like line profile.
- e: Detection at the edge of the bandpass; measured parameters may be uncertain.
- i: Possible interference or contamination from an offband source near the line profile.
- n: Noisy line profile.
- p: Peculiar line profile.
- G: Observations made with the Green Bank 140-ft telescope.

4.2. Investigation of possible source confusions

For each of our detected sources, we queried the NED database over a region surrounding the optical position of the target galaxy in order to identify possible interlopers or confused sources in our HI observations. In events of possible confusion with previously known HI sources, published HI spectra of the possible interloper were compared with our new observations whenever possible. In addition, Digitized Sky Survey (DSS) images of all the regions surrounding detected sources were examined visually for uncatalogued galaxies lying within $1.5\times$ the Nançay or Green Bank FWHP beam dimensions. The results of these searches are described in the Notes to individual objects in Appendix A.

In a few cases we find additional galaxies within our projected beam with angular sizes comparable to or larger than that of our target, but without known redshifts. For these galaxies, an asterisk (“*”) is appended to the target name in Table 1 and Fig. 2 to indicate some uncertainty of the identification of our HI detection. The redshifts of these galaxies will require reconfirmation via optical observations.

In situations where we have detected multiple HI sources during observations of a single target and cannot unambiguously resolve which source corresponds to our original target, we list the HI parameters of both detections in Table 1, and designate the two sources with an “a” and a “b”, respectively, appended to the galaxy’s name. Finally, in instances where the systemic velocity of the line profile corresponds closely to that of an interloper with known redshift, the galaxy is declared a questionable detection and is placed in Table 2 (see below), along with an explanatory Note in Appendix B.

4.3. Marginally-detected, confused, and undetected sources

Table 2 presents the HI parameters derived for marginal or questionable detections. Included in Table 2 are both potential detections of low signal-to-noise, and cases where our detected line profile is deemed likely to result from confusion with a galaxy of previously known redshift. The columns of Table 2 are defined identically to the similarly-headed columns of Table 1. An asterisk in the “Notes” column indicates an additional note is found in Appendix B.

In Table 3 we list the observed targets for which no clear line signal was detected. The velocity search ranges covered for each target galaxy are listed in Col. 7 of Table 3, along with the rms of the corresponding spectrum in Col. 6. An asterisk in the “Notes” column indicates an additional note is found in Appendix C, and a “G” denotes galaxies observed at Green Bank.

5. Comparison with other observations

After our Nançay survey program had begun, HI observations for a number of the galaxies in our sample were published by Giovanelli et al. (1997) and by Theureau et al. (1998). The data of Giovanelli et al. were obtained with the Arecibo telescope, while the data of Theureau et al. were obtained at Nançay, hence we have samples available to provide both external and internal checks on our absolute flux calibration.

We have 15 galaxies in common with the sample of Theureau et al. (1998). Figure 3 shows a comparison of our respective heliocentric radial velocities, integrated line fluxes (after correction for beam attenuation), and linewidths ($W_{20,c}$ and $W_{50,c}$) after correction for instrumental resolution.

Table 3. Undetected sources

Galaxy Name (1)	α (B1950.0) (2)	δ (B1950.0) (3)	Type (4)	$a \times b$ (5)	rms (mJy) (6)	Search Range (7)	Notes (8)
FGCE 26	00 10 47.0	-39 00 29	Scd	0.67×0.07	11.3	600–5200	G
FGC 23	00 11 13.0	+43 02 31	Sdm	1.51×0.17	4.54	341–5299,5023–10138	
FGCE 0033	00 14 17.6	-42 35 40	Scd	0.92×0.09	11.4	503–5400	G
FGC 30	00 16 28.2	+26 21 09	Sd	1.01×0.11	3.63,3.81	341–5299,5023–10138	
ESO 294-004	00 18 51.9	-40 44 33	Scd	1.34×0.19	13.0	600–5200	G
FGC 38	00 19 56.2	-10 58 25	Sd	0.76×0.08	2.79	341–5299	
ESO 294-006	00 20 25.4	-42 11 28	Sc	1.12×0.09	12.3	600–5200	G
FGCE 0045	00 21 11.8	-38 56 28	Scd	0.86×0.12	13.3	600–5200	G
ESO 294-011	00 24 59.6	-40 52 54	Scd	1.34×0.19	10.6	1914–6362	G
UGC 263	00 24 34.7	+43 46 39	Sdm	1.48×0.22	3.33,3.67	341–5299,5023–10138	
FGC 63	00 32 55.5	-11 03 17	Sd	0.91×0.10	3.57,3.35	341–5299	
FGCE 82	00 44 35.7	-41 28 47	Sc	1.14×0.09	12.9	600–5200	G
ESO 295-028	00 59 12.1	-40 40 16	Sc	1.05×0.11	16.1	600–5200	G
FGC 132	01 09 47.4	-17 12 49	Sdm	0.81×0.09	4.11,4.16	341–5299,5023–10138	
UGC 786	01 11 46.3	+50 11 05	Sd	1.09×0.15	4.34,4.01	341–5299,5023–10138	
FGCE 157	01 23 28.8	-36 15 27	Sd	1.10×0.09	3.42,5.07	341–5299,5023–10138	
FGC 169	01 25 02.8	-10 39 51	Sd	0.73×0.09	3.11,2.10	341–5299,5023–10138	
ESO 297-013	01 34 25.2	-41 18 18	Sc	1.00×0.13	11.0	600–5200	G
FGC 193	01 45 26.8	+50 38 22	Sdm	0.73×0.10	4.46,4.05	341–5299,5023–10138	
FGC 245	02 04 05.7	+46 01 06	Sd	1.12×0.13	4.23	341–5299	
FGC 269	02 13 12.2	-10 18 50	Sd	1.12×0.12	6.31	341–5299	
FGC 284	02 20 04.6	+17 35 17	Sd	1.01×0.10	7.50	600–5200	G
UGC 1927	02 24 59.3	+43 22 05	Sdm	1.15×0.09	3.98	341–5299	
FGC 298	02 25 42.2	-02 44 21	Sd	1.10×0.09	2.81	341–5299	
UGC 2068	02 32 17.3	+40 40 34	Sdm:	1.09×0.17	3.33	341–5299	
FGC 326	02 36 00.0	+10 33 25	Sd	1.01×0.10	2.94	341–5299	
FGC 333	02 39 19.1	+41 47 11	Sdm	1.04×0.10	3.61	341–5299	
FGCE 260	02 39 39.4	-33 10 02	Sdm	1.01×0.13	13.8	600–5200	G
FGC 362	02 53 11.6	+27 29 40	Sdm	1.10×0.11	3.92,4.57	341–5299,5023–10138	*
FGCE 282	02 57 23.0	-39 47 32	Scd	1.10×0.11	14.2	600–5200	G
UGC 2584	03 09 10.1	+00 51 29	Sd	1.06×0.07	2.25	341–5299	
FGC 418	03 21 16.8	+14 55 32	Sdm	0.90×0.12	3.35	341–5299	
FGC 59A	03 32 10.8	+00 07 47	Sd	1.01×0.17	3.89,3.47	341–5299,5023–10138	
FGC 443	03 38 15.4	+13 24 50	Scd	1.40×0.16	2.82,2.81	341–5299,4559–9658	
FGC 448	03 42 30.8	-04 25 58	Sdm	0.97×0.12	2.96	341–5299	
FGCE 358	03 52 21.7	-41 04 50	Sd	0.58×0.06	14.9	600–5200	G
FGC 67A	04 07 46.4	+00 41 02	Sab	1.01×0.20	3.87,2.80	341–5299,5023–10138	
FGC 472	04 14 35.1	-03 30 28	Sd	0.64×0.07	3.82	341–5299	
FGC 477	04 16 13.4	-15 05 53	Sd	0.65×0.06	2.82,2.99	341–5299,5023–10138	*
FGC 479	04 20 18.3	+30 46 50	Sdm	0.64×0.09	3.11	341–5299	
FGC 480	04 20 19.3	-07 12 22	Sd	0.63×0.09	4.98	341–5299	
FGCE 397	04 22 54.5	-41 44 12	Scd	0.71×0.10	16.5	600–5200	G
FGC 492	04 31 30.1	+01 18 29	Sd	0.92×0.09	4.11	341–5299	
FGC 494	04 32 59.0	-09 02 13	Sd	0.93×0.09	2.83	341–5299	
FGCE 421	04 36 42.0	-22 26 12	Sd	0.59×0.07	3.94	341–5299	
FGC 496	04 39 17.9	+66 57 35	Sdm	0.74×0.09	10.9,3.16	341–5299,5023–10138	
FGC 507	04 47 05.4	+00 23 40	Sd	0.80×0.11	5.21	341–5299	
FGC 522*	05 03 52.5	+85 32 05	Sd	0.99×0.10	...	...	*
FGC 80A	05 05 08.9	-02 02 38	Sm	0.86×0.16	3.31	341–5299	
FGC 532	05 18 23.6	-16 00 59	Sd	0.90×0.11	5.22,6.33	341–5299,5023–10138	
FGC 544	05 46 23.6	-12 31 03	Sd	0.62×0.08	3.80	341–5299	
FGCE 529	05 46 59.4	-17 30 23	Sd	0.87×0.09	3.69	341–5299	
FGCE 535	05 47 48.1	-20 17 51	Sd	0.67×0.09	7.18	341–5299	
FGC 548	05 56 25.7	+60 26 41	Sd	0.74×0.08	5.42	341–5299	
FGCE 552	05 59 34.8	-34 46 56	Sd	0.78×0.07	4.98	341–5299	
FGC 557	06 09 15.8	+53 07 34	Sd	1.19×0.16	4.80,4.07	341–5299,5023–10138	
FGCE 569	06 11 02.0	-34 14 09	Sd	0.90×0.11	3.99,3.67	341–5299,5023–10138	
FGC 559	06 15 22.4	+67 30 41	Sdm	0.86×0.09	6.32,3.53	341–5299,5023–10138	
FGC 564	06 18 41.8	+56 13 52	Scd	1.03×0.10	4.39,3.98	341–5299,5023–10138	
FGC 566	06 22 34.5	+48 43 12	Sd	0.96×0.11	4.18,3.61	341–5299,5023–10138	
FGCE 595	06 23 53.8	-34 23 29	Sd	0.87×0.09	3.39,3.98	341–5299,5023–10138	
ESO 308-012	06 29 30.7	-38 02 03	Sd	0.81×0.11	3.71,5.22	341–5299,5023–10138	
FGCE 602	06 30 03.7	-35 53 08	Sd	0.76×0.09	3.57,4.09	341–5299,5023–10138	
FGC 575	06 30 44.0	+64 43 38	Sd	0.91×0.09	6.71,4.16	341–5299,5023–10138	
ESO 427-007	06 45 41.7	-30 27 44	Sd	1.19×0.17	3.33	341–5299	
FGC 587	06 47 03.9	+45 35 16	Sdm	0.78×0.08	3.79,1.78	341–5299,5023–10138	
FGCE 643	07 10 54.9	-35 23 52	Sd	0.95×0.11	4.52,3.65	341–5299,5023–10138	
UGC 3814	07 18 37.7	+49 22 48	Sm	0.84×0.11	4.42,3.39	341–5299,5023–10138	
FGC 634	07 30 27.8	+20 34 08	Sd	0.64×0.08	4.01	341–5299	
FGC 643	07 33 53.1	+27 06 58	Sm	0.63×0.08	4.67,2.07	341–5299,5023–10138	

Table 3. continued

Galaxy Name (1)	α (B1950.0) (2)	δ (B1950.0) (3)	Type (4)	$a \times b$ (5)	rms (mJy) (6)	Search Range (7)	Notes (8)
FGC 642	07 33 23.2	+59 57 37	Sdm	1.21×0.12	4.54,4.28	341–5299,5023–10138	
FGC 653	07 40 31.8	+60 14 35	Sd	0.81×0.10	5.99,2.88	341–5299,5023–10138	
FGC 673	07 49 43.7	+61 17 08	Sd	1.11×0.09	6.05,5.60,3.18	342–5364,5023–7594,7524–12725	
FGC 676	07 50 52.0	+51 46 14	Scd	1.04×0.10	3.65,3.83,6.52	341–5299,5023–10138	
FGC 705	08 00 48.2	+43 46 41	Sm	0.99×0.10	3.60,1.89	341–5299,5023–10138	
FGCE 687	08 04 26.7	–19 22 24	Sd	0.81×0.09	3.24	341–5299	
FGC 721	08 07 22.7	+49 43 49	Sd	0.86×0.10	4.36	341–5299	
FGC 744	08 18 56.4	+10 29 37	Sd	0.68×0.09	3.18	341–5299	
FGC 758	08 25 04.3	+56 15 31	Sd	0.85×0.09	3.94	341–5299	
FGC 761	08 27 17.3	–19 43 17	Sm	0.78×0.10	4.64	341–5299	
FGC 767	08 29 45.1	+03 40 14	Sdm	0.65×0.09	3.33	341–5299	
FGCE 705	08 31 09.2	–24 28 43	Sd	1.01×0.09	2.57,3.48	341–5299,5023–10138	
FGC 769	08 31 35.9	+59 05 42	Sd	0.76×0.09	4.55	341–5299	
FGC 787	08 40 59.3	–01 38 58	Sd	0.78×0.08	2.97	341–5299	
FGC 788	08 41 18.7	+29 17 09	Sd	0.99×0.09	3.36,2.66	341–5299,5023–10138	
FGC 811	08 51 19.3	+40 12 51	Sd	0.94×0.10	3.52,3.69	341–5299,5023–10138	
FGC 813	08 51 36.3	+52 13 37	Sd	0.85×0.09	4.39	341–5299	
ESO 497-029	09 13 29.7	–23 29 30	Sd	1.66×0.20	4.03,2.64	341–5299,5023–10138	
UGC 4911	09 14 28.3	+54 24 05	Sd	1.12×0.10	5.72	341–5299	
FGC 875	09 17 21.1	+39 26 48	Sd	0.73×0.10	4.63	341–5299	
FGC 912	09 33 00.0	+23 08 49	Sd	0.90×0.09	2.37	341–5299	
FGC 923	09 37 55.8	+31 58 24	Sd	0.96×0.11	3.34	341–2833	
FGC 926	09 38 46.0	+48 19 10	Sd	0.93×0.10	4.31	341–5299	
FGC 959	09 49 36.7	+44 51 37	Sd	1.15×0.08	4.67,3.41	341–5299,5023–10138	
FGC 1049	10 16 05.6	+16 24 04	Sd	0.81×0.10	2.94	341–2833	
FGC 1097	10 30 53.0	+17 59 55	Sd	1.10×0.10	2.02	341–5299	
FGC 1109	10 35 37.9	+70 01 02	Sd	0.67×0.08	5.01	341–5299	
UGC 5815	10 38 29.7	+51 04 25	Sd	1.27×0.10	5.50,5.74	341–5299,5023–10138	
FGC 1124	10 39 36.6	+42 24 41	Sd	0.66×0.09	4.99	341–5299	
FGC 1183	10 59 03.5	+71 16 30	Sd	1.02×0.09	5.99	341–5299	
FGC 1193	11 02 55.0	–09 47 22	Sd	1.01×0.10	4.71	341–5299	
UGC 6226	11 08 36.7	+00 53 57	Sd	1.12×0.10	2.89	341–5299	
FGC 1231	11 17 55.4	+06 31 14	Sdm	1.01×0.11	2.92,5.27	341–5299,5023–10138	
FGC 1263	11 28 24.7	–03 48 20	Sd	0.92×0.10	4.60	341–5299	
FGC 1301	11 42 05.9	+15 02 29	Sd	1.27×0.12	2.54,5.13	341–5299,5023–10138	
FGC 1308	11 45 00.0	+62 17 34	Sdm	0.90×0.10	4.07	341–5299	
FGC 1332	11 53 08.1	+25 11 53	Sdm	0.94×0.10	2.54	341–5299	
FGC 1351	11 59 47.1	+63 23 43	Sd	0.85×0.11	4.66	341–5299	
FGC 1360	12 02 38.9	+40 31 21	Sd	0.88×0.09	3.73	341–5299	
FGC 1370	12 05 07.3	–16 34 12	Sd	0.75×0.10	4.05	341–5299	
FGC 1387	12 11 27.9	+21 55 19	Sd	0.73×0.09	2.70	341–5299	
UGC 7318	12 14 51.3	+49 46 29	Sd	0.94×0.09	4.37,5.96	341–2833,2766–7805	
ESO 574-015	12 34 36.5	–19 14 50	Sd	1.05×0.10	3.65	341–5299	
FGC 1478	12 35 14.9	+74 47 00	Sd	0.93×0.07	6.54	341–5299	
FGC 1483	12 37 11.7	–17 16 04	Sd	0.95×0.09	4.17	341–5299	
FGC 1492	12 40 45.4	+46 07 28	Sd	1.04×0.09	3.26	341–5299	
FGC 1547	13 01 40.0	+54 02 14	Sdm	0.76×0.09	3.24	341–5299	
UGC 8176	13 02 41.0	–00 06 27	Sd	1.09×0.13	3.14,3.40	341–5299,5023–7594	
FGC 1553	13 03 01.7	+25 27 35	Sd	0.93×0.08	3.00	341–5299	
FGC 1559	13 04 07.3	+53 46 56	Sd	0.82×0.10	4.27	341–5299	
FGC 1595	13 17 01.3	+34 44 32	Sdm	1.21×0.17	3.13,2.59	341–5299,5023–10138	
FGCE 1066	13 25 39.3	–19 15 42	Sd	0.90×0.09	3.49	341–5299	
FGC 1635	13 31 23.6	–10 51 03	Sd	0.99×0.07	2.76	341–5299	
FGC 1661	13 41 49.2	+55 12 14	Sd	0.87×0.08	3.71	341–5299	
FGC 1684	13 53 14.4	+79 57 08	Sd	0.68×0.08	8.69	341–5299	
FGC 1686	13 55 02.5	+41 36 32	Sd	0.68×0.09	3.66	341–5299	
FGC 1689	13 55 42.0	+10 30 41	Sd	0.65×0.09	2.78	341–5299	
FGC 1690	13 55 52.4	+29 06 03	Scd	1.46×0.18	3.20,3.27	341–5299,5023–10138	
FGC 1701	13 58 47.8	+43 48 20	Sd	0.80×0.11	3.80	341–5299	
FGC 1708	14 01 51.5	–00 13 01	Sd	0.90×0.10	3.42	341–5299	
FGC 1727	14 10 34.8	–07 12 49	Sm	0.67×0.08	3.34	341–5299	
FGC 1728	14 10 36.0	–06 15 26	Sd	0.62×0.08	2.66	341–5299	
FGC 1739	14 15 16.4	+07 39 17	Sd	0.99×0.09	2.87	341–5299	
FGC 1741	14 15 56.5	–04 55 26	Sd	1.15×0.10	3.01	341–5299	
FGC 1769	14 31 38.9	+09 18 24	Sdm	0.97×0.11	2.76	341–5299	
FGC 1774	14 33 36.1	–02 39 57	Sd	0.86×0.11	3.44	341–5299	
FGC 1783	14 36 05.9	+26 07 19	Sd	0.86×0.09	4.06	341–5299	
FGC 1784	14 36 18.5	+07 50 01	Sdm	0.81×0.10	3.00	341–5299	
FGC 1862	15 09 03.8	+54 38 42	Sd	0.99×0.10	4.75,3.58	341–5299,4559–9658	
FGC 1866	15 12 11.5	+71 26 55	Sdm	0.78×0.10	5.18	341–5299	

Table 3. continued

Galaxy Name (1)	α (B1950.0) (2)	δ (B1950.0) (3)	Type (4)	$a \times b$ (5)	rms (mJy) (6)	Search Range (7)	Notes (8)
FGC 1870	15 12 59.3	-10 16 51	Sd	0.83×0.09	3.01,2.81	341-5299,5023-10138	
FGC 1889	15 19 47.5	+42 04 44	Sd	0.80×0.09	3.49	341-5299	
FGC1904	15 25 58.9	+43 14 20	Sd	0.78×0.10	3.71	341-5299	
FGC 1909	15 28 38.6	+49 11 42	Sd	0.83×0.09	4.08	341-5299	
FGC 1911	15 31 27.5	-09 21 23	Sdm	0.65×0.09	3.39	341-5299	
UGC 9957	15 37 26.3	+40 18 23	Sd	1.12×0.10	3.06,3.04	341-5299,4559-9658	
FGC 1933	15 38 37.9	+06 07 27	Sd	0.88×0.11	3.24	341-5299	
FGC 1936	15 39 33.1	-09 27 32	Sd	0.82×0.09	3.62	341-5299	
FGC 1941	15 40 39.7	+16 56 22	Sd	0.86×0.10	3.29	341-5299	
FGC 1956	15 46 52.9	+71 36 41	Sd	0.72×0.10	4.52	341-5299	
FGC 1966	15 52 07.6	+45 32 51	Sd	1.04×0.09	3.36,3.41	341-5299,5023-10138	*
FGC 1972	15 56 35.2	+41 23 10	Sd	0.91×0.09	5.10	341-5299	
FGC 1990	16 06 15.9	+62 40 11	Sd	0.90×0.09	5.22,6.03	341-5299	
FGC 2006	16 12 41.7	+27 59 08	Sd	0.99×0.12	3.70	341-5299	
FGC 2017	16 16 04.1	+01 16 40	Sd	1.12×0.09	3.04	341-5299	
UGC 10459	16 33 28.6	+41 05 34	Sd	1.67×0.12	3.63,4.18	341-5299,5023-10138	
UGC 10489	16 36 48.7	+62 50 30	Sd	1.57×0.11	6.87,5.73	341-5299,5023-10138	
FGC 2079	16 51 17.8	-04 30 04	Sd	1.23×0.10	4.30,3.36	341-5299,5023-10138	
UGC 10694	17 03 21.7	+43 18 07	Sd	1.15×0.08	6.95	341-5299	
FGCE 1316	18 35 28.5	-42 38 46	Sc	1.10×0.13	11.7	600-5200	G
UGC 11387	18 58 24.0	+42 14 25	Sd	1.12×0.10	6.01	341-5299	
FGCE 1345	19 00 55.6	-38 26 19	Sc	1.43×0.10	12.0	600-5200	G
ESO 337-015	19 11 57.7	-40 55 12	Sc	1.18×0.11	14.2	600-5200	G
ESO 338-001	19 18 33.5	-38 18 04	Scd	1.01×0.10	10.7	600-5200	G
ESO 283-010	19 32 10.3	-44 04 59	Scd	2.06×0.22	16.2	600-5200	G
FGCE 1390	19 37 34.6	-38 29 17	Scd	0.81×0.11	11.9	600-5200	G
ESO 339-005	19 51 37.5	-38 49 47	Sc	1.51×0.20	12.7	600-5200	G
ESO 339-030	19 59 38.4	-41 42 40	Scd	1.18×0.13	14.8	600-5200	G
ESO 340-024	20 20 50.8	-39 12 01	Sbc	0.99×0.11	12.0	600-5200	G
FGC 2270	20 27 32.3	-11 34 43	Scd	1.12×0.10	4.09,3.65	341-5299,5023-10138	
FGC 2272	20 28 59.6	-06 50 34	Sd	0.73×0.08	3.77	341-5299	
FGCE 1504	20 36 44.8	-41 11 28	Scd	0.92×0.12	17.5	600-5200	G
ESO 341-008	20 38 59.3	-42 29 39	Sc	1.15×0.13	11.9	600-5200	G
FGC 2284	20 39 38.9	-04 17 07	Sd	0.68×0.08	4.78	341-5299	
FGC 2285	20 39 48.6	-04 11 23	Sd	0.65×0.08	2.60	341-5299	
FGC 2288	20 45 47.9	-17 25 40	Sd	2.08×0.10	2.67,3.98	341-5299,5023-7594	
ESO 597-039	20 46 44.0	-22 18 17	Sd	1.10×0.11	5.00	341-5299	
FGCE 1543	20 56 30.4	-41 47 13	Sbc	1.66×0.17	14.2	600-5200	G
FGCE 1544	20 57 39.1	-43 00 45	Scd	0.87×0.12	13.2	600-5200	G
FGCE 1552	21 00 41.9	-34 36 13	Sd	0.76×0.09	4.67,3.79	341-5299,5023-7594	
FGC 2312	21 06 27.8	+04 29 06	Sd	0.67×0.06	4.89	341-5299	
FGC 2320	21 19 40.8	-20 25 06	Sd	0.81×0.07	3.05,2.81	341-5299,5023-10138	
FGCE 1631	21 35 26.5	-43 56 06	Scd	0.64×0.09	14.2	600-5200	G
ESO 288-003	21 43 52.9	-42 53 56	Sc	1.21×0.17	12.0	600-5200	G
FGC 2341	21 45 00.7	-12 35 05	Sdm	0.62×0.08	3.78	341-5299	
FGC 2342	21 45 21.2	+25 39 28	Sd	0.67×0.08	3.14	341-5299	
FGC 2344	21 48 40.9	-13 32 19	Sdm	0.81×0.09	3.91,3.43	341-5299,5023-10138	
FGC 2357	21 58 57.6	+03 19 18	Sdm	0.80×0.08	4.03,2.32	341-5299,5023-10138	*
FGC 2369	22 07 21.6	+07 11 01	Sd	0.82×0.10	4.34,3.77	341-5299,5023-10138	
FGCE 1699	22 05 14.9	-38 27 04	Sc	1.08×0.13	18.1	600-5200	G
FGC 2369	22 07 21.6	+07 11 01	Sd	0.82×0.10	4.43,3.77	341-5299,5023-10138	
FGC 2374	22 11 05.9	-14 03 42	Sd	0.73×0.07	5.66,2.39	341-5299,5023-10138	
ESO 345-023	22 30 35.6	-38 02 34	Sd	1.59×0.17	6.08,3.58	341-5299,5023-7594	
ESO 345-037	22 37 30.7	-40 17 30	Scd	1.18×0.15	12.6	600-5200	G
FGCE 1772	22 41 04.7	-38 55 13	Scd	0.78×0.11	10.6	600-5200	G
ESO 291-003	23 08 23.5	-43 07 06	Sdm?sp	2.02×0.20	15.2	600-5200	G
UGC 12536	23 18 31.8	+43 19 35	Sdm	1.19×0.17	3.39,4.64	341-5299,5023-10138	
FGCE 1836	23 33 42.4	-40 21 18	Sd	0.78×0.10	12.0	600-5200	G
FGCE 1868	23 51 57.1	-38 50 33	Sc	1.10×0.11	12.0	600-5200	G

Our radial velocities show excellent agreement with those of Theureau et al.; velocity differences are smaller than our quoted errors in most cases. Agreement between the integrated fluxes is less good; Fig. 3 reveals that on average, our derived fluxes appear systematically higher than those reported by Theureau et al. Since both of our groups corrected for beam attenuation in a similar manner, the discrepancy must stem from either differences in calibration or spectral quality. We return to this below. Finally we see that agreement between our $W_{50,c}$ values is quite good, and well within estimated errors. As expected, noise and scatter increases somewhat among the

$W_{20,c}$ values, which are more sensitive to spectral noise and baseline uncertainties.

Sixty of the galaxies observed by Giovanelli et al. (1997) are in common with our present sample. Thirty-seven of these galaxies are mutual detections, and 6 are mutual non-detections. Giovanelli et al. also detected 11 of our undetected targets at velocities outside our search ranges, while we detected 3 objects outside the velocity ranges that they searched. Finally, there are 2 cases for which we were unable to confirm the Giovanelli et al. detections in our spectra obtained over the corresponding velocity range (noted in Appendix C), and one case

Fig. 3. A comparison of HI parameters measured from the present survey (along the y -axis) and those derived by Theureau et al. (1998; along the x -axis) for 15 galaxies in common between the samples. Top left: heliocentric radial velocities, in km s^{-1} . Top right: integrated line fluxes, in Jy km s^{-1} , after correction for beam attenuation. Lower left: line widths measured at 20% peak maximum, in km s^{-1} , after correction for spectral resolution. Lower right: line widths measured at 50% peak maximum, after correction for spectral resolution. Error bars are overplotted for our data, except on the V_h panel, where uncertainties are smaller than the data points. To guide the eye, the solid line in all four panels delineates $y = x$; these lines are not fits to the data

where our measured velocities show substantial disagreement ($\Delta V \sim 1000 \text{ km s}^{-1}$; see Appendix B).

Figure 4 shows a comparison of the respective V_h , $W_{50,c}$, and S_c values for the 37 mutual detections measured by us and by Giovanelli et al. (Giovanelli et al. did not publish $W_{20,c}$ estimates). Once again, we see that agreement between our radial velocity measurements is generally excellent, and in most cases, differences are smaller than our estimated uncertainties.

Scatter between our linewidth measurements is somewhat larger than that seen in our comparison with Theureau et al. data (Fig. 3). The three most discrepant galaxies include UGC 11188 (which fell near the edge of our observed bandpass) and two objects for which our spectra are considerably noisier than those of Giovanelli et al.⁴. The remaining scatter may partially stem from the different techniques our respective groups used to measure the linewidths.

⁴ Copies of the individual spectra for the Giovanelli et al. sample were kindly provided to us through M.P. Haynes and M.S. Roberts.

Fig. 4. A comparison of HI parameters measured from the present survey (along the y -axis) and those derived by Giovanelli et al. (1997; along the x -axis) for 37 galaxies in common between the samples. Top left: heliocentric radial velocities, in km s^{-1} . Top right: integrated line fluxes, in Jy km s^{-1} , after correction for beam attenuation. Bottom: line widths measured at 50% peak maximum, after correction for spectral resolution. Error bars are overplotted for our data, except on the V_h panel, where uncertainties are smaller than the data points. To guide the eye, the solid line in all three panels delineates $y = x$; these lines are not fits to the data

For sources with $S \leq 4 \text{ Jy km s}^{-1}$, we find agreement between our beam-corrected flux integrals is in most instances consistent with calibration uncertainties, although a few cases disagree by more than 50%. For higher values of S_c , we see a systematic increase in the integrated fluxes reported by Giovanelli et al. compared with our values. Since in most cases, corrections for beam attenuation in our sample are small, this suggests that the beam correction factors applied by Giovanelli et al. may tend to overestimate the true line flux of larger galaxies. An additional implication is that the offset of several of our fluxes compared with Theureau et al. (Fig. 3) is likely to result from a systematic underestimation of integrated fluxes by those workers, rather than an overestimation by us. This may stem from calibration differences, differences in baseline fits, or differences in spectral quality. Unfortunately Theureau et al. did not publish their individual spectra, hence we are unable to resolve this issue through a direct comparison of the data.

Table 4. Detection rates for Hubble types observed in the present survey

Type	# Observed	# Detected	% Detected
Sab	1	0	0
Sb	1	1	100
Sbc	2	0	0
Sc	13	1	8
Scd	36	12	33
Sd	303	148	49
Sdm	99	60	61
Sm	13	7	54
Irr	4	3	75

6. Discussion

6.1. Detection rates and implications

The present survey has demonstrated that late-type spiral galaxies selected on the basis of their highly flattened disks and large disk axial ratios are readily detectable in H I 21-cm emission within the local universe (see also Giovanelli et al. 1997). Figure 5 illustrates the distribution of radial velocities for the galaxies detected in the present survey. In total, we detected roughly 50% of our targets (232 galaxies) within the search range $V_h \lesssim 10\,000 \text{ km s}^{-1}$. Seven of the detections included multiple sources detected toward a single target (see Table 1). Seventy-eight per cent of our detected galaxies had no previously reported detection in H I. We emphasize that our detection rate should be regarded only as a lower limit for the H I detectability of late-type FGC sources, since due to scheduling constraints, the velocity coverage and limiting signal-to-noise were not uniform for all of our targets (cf. Tables 1–3). With full velocity coverage observations of sufficient sensitivity, it is expected that virtually all of the FGC galaxies should be detectable in H I within $V_h \lesssim 20\,000 \text{ km s}^{-1}$ (cf. Giovanelli et al. 1997).

Figure 5 demonstrates that the present survey has added a number of gas-rich galaxies to samples both within the Local Supercluster ($V_h \lesssim 3\,000 \text{ km s}^{-1}$) and beyond it. It is no surprise that late-type, pure disk galaxies are generally gas-rich systems, readily detectable in H I. However, the high detection rate of our survey and of the Giovanelli et al. (1997) FGC survey underscore the important fact that *late-type, pure disk galaxies are abundant in the nearby universe, and hence represent one of the most common products of galaxy disk formation* (see also van der Kruit 1987). Furthermore, since our current survey has explored only nearly edge-on systems, numerous additional examples of analogous galaxies are certain to exist among samples of recently-catalogued extreme late-type and low surface brightness galaxies seen at lower inclinations (see also Dalcanton & Schechtman 1996; Matthews & Gallagher 1997). Even if their overall contribution to the mass and luminosity density of the universe is small, late-type, pure disk galaxies are not negligible in terms of number counts. Any model of galaxy disk formation and

Fig. 5. Histogram showing the number of galaxies detected in the present survey as a function of heliocentric radial velocity, in km s^{-1}

evolution must therefore account for the abundance and properties of these small disks, as well as their survival into the present epoch.

Table 4 summarizes the range of Hubble types covered in the present survey, and the detection rates for each type. In contrast to the FGC survey of Giovanelli et al. (1997), our survey concentrated on FGC and related galaxies with Hubble types later than Scd, hence we observed relatively few Sc and earlier spirals. Nonetheless, even given the small numbers of statistics, we note a sharp falloff in the detection rate of Sc targets compared with Scd and later systems. This may be partly due to the fact that most Sc targets in our survey were at low declinations (where sensitivity is reduced due to higher system temperatures), and partly due to the fact that previously undetected Sc spirals are rarer within our search range than new examples of smaller and fainter disk systems.

6.2. The nature of the detected objects

A detailed analysis of the properties of the objects detected in our survey is beyond the scope of the present paper. Nonetheless, we briefly remark here on a few trends.

6.2.1. Spectral morphologies

An examination of Fig. 2 reveals that the spectra of the galaxies we have detected most often exhibit the classic double-peaked rotational profiles expected for late-type, rotationally-supported disk galaxies seen near edge-on. Very few of the galaxies in the present survey were resolved significantly by the telescope beam; therefore subject to signal-to-noise limitations, our spectra should be accurate representations of the globally averaged rotation profiles of the H I disks of these galaxies.

Fig. 6. An *R*-band CCD image of FGC 175 obtained with the WIYN telescope. The exposure time was 750 s and seeing was $\sim 1''.0$. The image is roughly $1'.1$ across; north is on top, west on the left

Fig. 7. An *R*-band CCD image of UGC 825 obtained with the WIYN telescope. The exposure time was 750 s, and seeing was $\sim 0''.54$. The image is roughly $1'.7$ across; north is on top, west on the left

Fig. 8. An *R*-band CCD image of FGC 2366 obtained with the WIYN telescope. The exposure time was 750 s, and seeing was $\sim 1''.3$. The image is roughly $1'.7$ across; north is on top, west on the left. Based on the blue-band axial ratios measured by Karachentsev et al. (1993), FGC 2366 is the axial ratio “record-setter” for the present sample, having $a/b = 21.6$

Fig. 9. Histogram showing the distribution of linewidths (in km s^{-1}) for the galaxies detected in the present survey. The linewidths shown were measured at 20% peak maximum and corrected for spectral resolution and cosmological effects, as described in Sect. 4.1

Since in some cases, optical classifications of edge-on, pure disk spirals can be difficult from images on survey plates alone, the H I profile type can serve as an additional check. In most cases, we find that the H I profile type correlates reasonably well with the optical Hubble classification of the object. For example, the profiles of the Sd and earlier galaxies typically exhibit more well-defined rotation horns than the Sdm and later systems, and the more luminous Sd systems with visible dust lanes tend to have broader rotation profiles than the more diffuse Sd objects. To illustrate this point, in Figs. 6, 7 and 8 we show optical *R*-band CCD images of 3 galaxies from the present sample. These images were obtained with the WIYN⁵ telescope at Kitt Peak. FGC 175 (Fig. 6) is an Sdm galaxy; UGC 825 (Fig. 7) is a fairly bright Sd with a prominent dust lane; and FGC 2366 (Fig. 8) is a moderate surface brightness Sd with no obvious dust lane, only a modest central light concentration, and with the highest catalogued axial ratio of all the galaxies in the present survey ($a/b = 21.6$). The optical morphologies of these galaxies may be compared with the corresponding global H I profiles in Fig. 2.

In spite of some general trends, within the broad categories of H I profile types we nonetheless still see a fair amount of diversity even for a given Hubble type (see Fig. 2). This suggests that the H I properties of late-type, pure disk systems do show variations, hence one needs to be cautious in too widely generalizing their properties before more detailed investigations of a significant number of the individual objects have been undertaken.

⁵ WIYN is a joint facility of the University of Wisconsin-Madison, Indiana University, Yale University, and the National Optical Astronomy Observatories.

Fig. 10. The distribution of HI linewidths (in km s^{-1}) from the present survey as a function of apparent axial ratio. The linewidths were measured at 20% peak maximum and corrected for spectral resolution and cosmological effects, as described in Sect. 4.1

Fig. 11. The same as in Fig. 10, but with data from Giovanelli et al. (1997) overplotted as diamonds, and with five additional superthin galaxies from the literature overplotted as filled circles (see Text). In order to be commensurate with the range of linewidths covered in the present survey, only datapoints with $W_{20} < 500 \text{ km s}^{-1}$ are shown from the Giovanelli et al. sample

6.2.2. Rotational velocities

Figure 9 summarizes the distribution of corrected rotational widths (full width at 20% peak maximum) of the HI profiles of our detected galaxies. These data are taken from Col. 10 of Table 1. Since all the galaxies are presumed to be nearly edge-on, no corrections for inclination have been attempted.

The observed range of linewidths is as expected for the Hubble types covered in the present survey, and we see a strong peak in the range $W_{20,c} = 200 - 225 \text{ km s}^{-1}$. For the Sd component of our sample, the mean corrected W_{20} is 244 km s^{-1} , and the median is 234 km s^{-1} ; for the Sdms, the mean is 197 km s^{-1} and the median is 202 km s^{-1} . Using the Nearby Galaxies Catalog (TNGC) of Tully (1988), we compare these averages to other

nearby, late-type spirals. For the 75 Sd ($T = 7$) galaxies in the TNGC with $i > 40^\circ$, we find a mean inclination-corrected W_{20} value of 235 km s^{-1} and a median of 238 km s^{-1} . For the 79 Sdm ($T = 9$) galaxies in the TNGC with $i > 40^\circ$, we find a mean $W_{20,i}$ of 221 km s^{-1} and a median of 213 km s^{-1} . We thus find no significant offsets if the rotational velocities of our sample of highly flattened Sd systems compared with other Sds. There is some hint that the Sdms in our present sample rotate slightly more slowly on average than the TNGC sample; this slight difference may be partly a consequence of our new sample containing larger numbers of less luminous Sdm systems than the TNGC.

6.2.3. Disk axial ratios versus rotational velocity

Figure 10 shows the $W_{20,c}$ values for the survey objects plotted as a function of apparent axial ratio. In Fig. 11 we show the same data, but this time we also include galaxies from the Giovanelli et al. (1997) FGC survey with $W_{20} < 500 \text{ km s}^{-1}$. The Giovanelli et al. sample contains a number of galaxies with $a/b \leq 7$ due to the fact that these authors included many of the FGCA galaxies in their survey. Galaxies for which we detected 2 emission profiles toward a single target were excluded from Figs. 10 and 11, as were cases where our line profile was detected near the edge of the bandpass. Using filled circles, we have also overplotted in Fig. 11 five well-known superthins from the literature, all with $a/b > 11$: UGC 711, UGC 7170, UGC 7321, UGC 9242, and ESO 146-014 (see Rönnback & Bergvall 1995; Cox et al. 1996; Matthews et al. 1999, 2000a).

Figures 10-11 demonstrate that a wide spread is seen among the $W_{20,c}$ values for the less highly flattened galaxies ($a/b < 10$) in the samples illustrated. This is expected, since pure disk systems with $a/b < 10$ will include a mixture of both “superthin” galaxies viewed several degrees away from edge-on, as well as edge-on, intrinsically thicker systems.

Of perhaps greater interest are the “extreme” superthin galaxies in the sample (i.e., those with $a/b \geq 15$). We note that no such galaxies were found with $W_{20} \lesssim 190 \text{ km s}^{-1}$, suggesting that perhaps there exists some minimum rotational velocity (or equivalently, mass) below which such systems cannot exist (see also Karachentsev 1999). Moreover, there appears to be a steep rise in the maximum permitted axial ratio for disks between $W_{20} \approx 100 \text{ km s}^{-1}$ and $W_{20} \approx 200 \text{ km s}^{-1}$.

In the combined sample of Figs. 11, 7 of the 27 galaxies with $a/b \geq 15$ fall in the narrow interval $190 \leq W_{20} \leq 210 \text{ km s}^{-1}$, including the most extreme object in the sample, FGC 2366, with $a/b = 21.6$ (see Fig. 8). Figures 10 and 11 also show a high density of objects with $a/b \leq 10$ in the interval and $210 \leq W_{20,c} \leq 280 \text{ km s}^{-1}$, while for $a/b > 15$, this range of rotational velocities is

unpopulated. Although we still have only a small number of statistics for galaxies with $a/b \geq 15$, the combination of these trends raises the interesting possibility that there may be certain mass ranges over which the most extreme superthin disks are most likely to form, or to retain their svelte appearances (see also Matthews et al. 2000a).

6.3. Environments of pure disk galaxies

It has been proposed that many flattened, pure disks galaxies, particularly those “superthin” objects with $a/b > 10$, must necessarily have remained largely unperturbed in order to preserve their thin, bulgeless, dynamically cold stellar disks (e.g., Reshetnikov & Combes 1997; Matthews 1998). The redshifts obtained in the present survey (together with those of Giovanelli et al. 1997), can be used to test this proposition by exploring the environments of these galaxies for the first time in three dimensions. A detailed examination of this problem is deferred to a later paper, but here we remark on a few trends.

In our present survey we find that among the 232 targets detected with a moderately high level of certainty (i.e. those listed in Table 1), incidences of true blended or confused HI profiles are relatively rare, in spite of the rather large beam sizes of the Nançay and Green Bank 140-ft telescopes ($4' \times \geq 22'$ and $21'$ FWHP, respectively). In only 10 cases were we able to identify a neighbor within 1.5 beam diameters of the target and having a similar redshift ($\Delta V_h \leq 400 \text{ km s}^{-1}$). These cases are described individually in more detail in Appendix A. In six of these instances, the target object is *not* a superthin, i.e., $a/b < 10$. The four exceptions to this are FGC 1845 ($a/b = 13.3$), UGC 11243 ($a/b = 11.2$), FGC 2264 ($a/b = 14.3$), and ESO 467–063 ($a/b = 12.4$). Although the thinness of the disks of these objects in the presence of a neighbor within a projected distance of $\lesssim 0.28 \text{ Mpc}$ is surprising, we do find that 3 of the 4 objects show signs of optical peculiarities, most likely due to the perturbation of the companion. ESO 467–063 was noted by Karachentsev et al. (1993) to have “curved ends”, and on the DSS, both FGC 2264 and UGC 11243 can also be seen to exhibit curvature. Only FGC 1845 seems to show no obvious optical peculiarities on the DSS or in optical CCD images obtained by Matthews et al. (unpublished). Overall we find the results of our survey to be consistent with the notion that *highly flattened pure disk galaxies tend to be relatively isolated objects*, and that the presence of a close neighbor tends to thicken their disks and/or alter their optical morphologies.

7. Summary

We have reported the results of an HI 21-cm line survey of a sample of 472, late-type, edge-on spiral galaxies.

Our targets were primarily selected from the Flat Galaxy Catalogue (FGC) of Karachentsev et al. (1993), and thus represent a sample of highly flattened, pure disk galaxies. Most of the galaxies observed have apparent disk axial ratios $a/b \geq 7$ and little or no bulge component. Our sample was primarily composed of Scd and later spirals, with an emphasis on the largest angular size and lowest optical surface brightness galaxies in the FGC. Our survey covered objects over the entire sky north of $\delta = -44.5^\circ$.

Approximately 50% of the targets (232 galaxies) were detected within $V_h < 10\,000 \text{ km s}^{-1}$; 78% of these galaxies had no previously reported redshifts and HI parameter measurements. Our detection rate should be regarded as a strict lower limit for the detectability of late-type pure disk galaxies within the nearby universe, since due to telescope scheduling limitations, the spectral noise level was not uniform for each target, and our velocity coverage for many of the undetected targets was incomplete. The high detection rate of our survey in spite of these limitations underscores that small, gas-rich, pure disk spirals are an extremely common constituent of the nearby universe. Our survey has added roughly 70 previously unrecognized gas-rich members to the Local Supercluster alone. Even if they do not contribute appreciably to the local luminosity density of the universe, any robust galaxy formation paradigm must account for the abundance of these small, bulge-free disks in the present epoch.

Among the targets detected in our present survey, non-dwarf companions appear to be rare. Only 10 targets are believed to have neighbors at similar radial velocities within a projected radius of $18'$ (i.e., ~ 1.5 times the FWHP telescope beam radius). Only 4 of these 10 galaxies are “superthin” (i.e. have axial ratios $a/b \geq 10$), and 3 of those 4 galaxies show signs of optical disturbances in their disks. Our data appear to be consistent with the notion that highly flattened, pure disk galaxies tend to be isolated galaxies, and that the presence of neighbors tends to thicken their disks and transform their disk morphologies. The data we have presented here, together with the complementary database of Giovanelli et al. (1997) should allow a more detailed investigation of the 3-D spatial distribution of pure disk galaxies in the local universe, as well as a wide variety of studies related to the properties of this common class of nearby galaxy.

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Extragalactic Database (LEDa), www-obs.univ-lyon1.fr; and the Digitized Sky Surveys (DSS), which were produced at the Space Telescope Science Institute under U.S. Government grant NAG W-2166.

Appendix A: Notes to Table 1

FGC 1 The Sb spiral MCG-01-01-028 is at a projected distance of 16'9 from FGC1 and has $V = 3813 \text{ km s}^{-1}$ (Huchra et al. 1993), although it should have been well outside of our beam and no HI detection of MCG-01-01-028 has previously been reported. Our narrow HI profile is consistent with the Sm classification of FGC1. An uncatalogued dwarf was also present in the beam.

ESO 350-005 An additional marginal detection was also present at $V_h \sim 3689 \text{ km s}^{-1}$ with $W_{20} \sim 225 \text{ km s}^{-1}$, and $S \sim 1.6 \text{ Jy km s}^{-1}$.

FGC 45 Although our detection is weak, it also appears in independent observations obtained with a different center velocity and velocity resolution, hence we believe it to be real.

FGCE 62 The narrowness of our detected HI profile and its low recessional velocity raise some doubt as to whether we have detected FGCE 62 itself, which has an Sd classification and rather small angular size ($D_{25} = 0'.8$); numerous other uncatalogued galaxies are visible on the DSS within the projected Nançay beam.

UGC 1461 Our detection of this source is rather marginal, but its validity was reconfirmed by Giovanelli et al. (1997).

FGC 202 Very low surface brightness appearance on the DSS.

FGC 273 Numerous galaxies are present in this field, most of which do not have published redshifts. It is unclear which, if either, of our detected line profiles corresponds to the target.

UGC 2382 The gap near the center of detected line profile is likely an artifact caused by the overlap of two autocorrelator banks; as a result, the integrated flux of the profile may be underestimated.

FGC 382 Our HI profile is single-peaked and appears rather dwarf-like for an Sd galaxy, but there is no obvious candidate for an interloper on the DSS. The S0/a NGC 1204 at 16'6 away has an optically-derived radial velocity of $V_h = 4282 \text{ km s}^{-1}$ (Da Costa et al. 1998), but it should have been well outside our beam. In addition, we have obtained both Nançay and Green Bank observations of FGC 382, and the fluxes and linewidths of both observations are consistent within errors in spite of the differing beam sizes, further suggesting the detection is unlikely to be due to confusion.

ESO 547-012 Our radial velocity is consistent with the optical value of $V_h = 1992 \text{ km s}^{-1}$ published in the ESO Catalogue (Lauberts & Valentijn 1988).

UGC 2728 An additional marginal feature is seen at $V_h \sim 906 \text{ km s}^{-1}$, with $W_{20} \sim 140 \text{ km s}^{-1}$, and $S \sim 0.84 \text{ Jy km s}^{-1}$.

UGC 2731 Both UGC 2731 and its Sd neighbor UGC 2738 (FGC54A), 3'7 away, were within our beam. Both have nearly identical angular sizes, luminosities, and surface brightnesses. However, the two sources we detect in our beam have very different radial velocities, suggesting in fact that this galaxy pair is not physically associated.

FGC 436 Although the detection in our spectrum is somewhat marginal, its validity was reconfirmed by Giovanelli et al. (1997).

FGC 476 FGC 476 and FGC 477 cross one another in projection on the sky, although a physical association between these galaxies is unlikely given that neither disk appears optically disturbed and the optical counterparts have very different angular sizes. Our peculiar HI line profile is likely due to the detection of the line at the overlap region of two autocorrelator banks. The velocity width of the profile suggests that we have detected the Scd galaxy FGC 476 rather than the much smaller angular size galaxy FGC 477, which is a type Sd. We detected an additional marginal feature at $V_h \sim 1056 \text{ km s}^{-1}$ with $W_{20} \sim 321 \text{ km s}^{-1}$ and $S \sim 1.4 \text{ Jy km s}^{-1}$ in our observations toward this position. Several uncatalogued dwarfs are also visible on the DSS in this region.

FGC 483 In addition to detecting FGC 483 at $V_h = 4966 \text{ km s}^{-1}$ (see also Giovanelli et al. 1997), our spectrum shows three peculiar HI peaks between $V_h = 6000 - 7500 \text{ km s}^{-1}$; the first has $V_h \sim 6408 \text{ km s}^{-1}$, $W_{20} \sim 106 \text{ km s}^{-1}$, and $S \sim 1.19 \text{ Jy km s}^{-1}$, the second has $V_h \sim 6892 \text{ km s}^{-1}$, $W_{20} \sim 228 \text{ km s}^{-1}$, and $S \sim 1.27 \text{ Jy km s}^{-1}$, and the third has $V_h \sim 7451 \text{ km s}^{-1}$, $W_{20} \sim 148 \text{ km s}^{-1}$, and $S \sim 1.04 \text{ Jy km s}^{-1}$. No interference is evident in any of the individual scans. The morphology of the HI profiles is that of confusion with a group of objects lying partially outside the telescope beam, but no obvious optical counterparts are visible on the DSS.

FGCE 415 Our detected line profile may correspond to either FGCE 415 itself or to an uncatalogued dwarf galaxy visible on the DSS and lying within our beam.

FGC 495 The spirals MCG-01-12-037 ($V_h = 4797 \text{ km s}^{-1}$; Tsvetkov & Bartunov 1993) and NGC 1625 ($V_h = 4759 \text{ km s}^{-1}$; Theureau et al. 1998) lie 11'1 and 13'9, respectively, from FGC 495 and may have overlapped with our beam; however the double-horned morphology of our detected line profile and its comparatively lower systemic velocity ($V_h = 4424 \text{ km s}^{-1}$) suggest that our detection is probably not due to a confusion with either galaxy. FGC 495 is thus likely to be an outlier of the small, loose galaxy group containing both of these objects.

UGC 3172 Two sources were detected in our beam. That the second source corresponds to UGC 3172 is confirmed by Giovanelli et al. (1997). The other source has a dwarf-like line profile with $V_h = 1492 \text{ km s}^{-1}$, $W_{20} = 140 \text{ km s}^{-1}$, and $S = 0.90 \text{ Jy km s}^{-1}$. We find no

obvious optical counterpart for the second source on the DSS.

ESO 552–016 A second dwarf-like feature is also detected in our spectrum at $V_h \sim 1884 \text{ km s}^{-1}$, with $W_{20} \sim 146 \text{ km s}^{-1}$, and $S \sim 0.91 \text{ Jy km s}^{-1}$. Several possible optical counterparts are visible on the DSS.

FGC 516 A second marginal detection is also present in the beam at $V_h \sim 2295 \text{ km s}^{-1}$ with $W_{20} \sim 235 \text{ km s}^{-1}$ and $S \sim 1.2 \text{ Jy km s}^{-1}$.

FGC 517 Our line profile is broad and asymmetric and has the appearance of a confused source. However, no catalogued galaxy is known to lie at a similar redshift; the profile shape may result from a slight a telescope pointing offset.

FGC 524 Our observation was actually aimed at the target FGC 522, catalogued at $\alpha = 05^{\text{h}}03^{\text{m}}52.5^{\text{s}}$, $\delta = +85^{\circ}32'05''$ (B1950.0); however no object is visible at this position on the DSS or in a deeper *R*-band CCD image obtained with the WIYN telescope (Matthews et al., unpublished) and this object was subsequently excluded from the Revised FGC (Karachentsev et al. 1999). Therefore we believe our HI detection to correspond to FGC 524, which lies 5'.9 from the reported position of FGC 522.

FGC 623 A second marginal source was present in our spectrum at $V_h \sim 1053 \text{ km s}^{-1}$ with $W_{20} \sim 219 \text{ km s}^{-1}$ and $S \sim 0.83 \text{ Jy km s}^{-1}$.

FGC 654 Our HI detection of FGC 654 is extremely weak, but we see a similar features at the same radial velocity in two independent spectra taken with different autocorrelator configurations; in addition, the width and velocity of the measured HI line are in agreement with the optically-derived recessional and rotational velocities reported for FGC 654 by Makarov et al. (1999; $V_h = 5187 \text{ km s}^{-1}$ & $V_{\text{max}} = 72 \text{ km s}^{-1}$).

FGC 684 Our detection of this source is rather marginal, but its validity was reconfirmed by Giovanelli et al. (1997).

FGC 689 The second source in our spectrum at $V_h = 772 \text{ km s}^{-1}$ appears to be the Im dwarf UGC 4117 (Schneider et al. 1990), 13'.3 from FGC 689.

FGC 821 The nearly face-on Sbc spiral NGC 2721 with $V_h = 3712 \text{ km s}^{-1}$, $W_{20} = 138 \text{ km s}^{-1}$ (Mathewson & Ford 1996) lies 3'.9 from FGC 821, but based on the double-horned morphology of our detected line profile, its velocity offset from NGC 2721, and its broader linewidth, our detection of FGC 821 seems unlikely to be due to a confusion.

FGC 826 FGC 826 appears on the DSS as a dwarf-like object of extremely low surface brightness. We detect a second marginal feature in our spectrum with $V_h \sim 2458 \text{ km s}^{-1}$, $W_{20} \sim 72 \text{ km s}^{-1}$, and $S \sim 1.0 \text{ Jy km s}^{-1}$.

FGCE 745 The highly peculiar HI profile we detect for FGCE 745 likely results from a blend with the E4 galaxy NGC 2865, 5'.7 away, with an optical radial velocity of $V_h = 2611 \text{ km s}^{-1}$ (de Vaucouleurs et al. 1991; hereafter RC3). Three HI detections have been reported for NGC 2865: based on Effelsberg observations, Huchtmeier

(1994) reports $V_{\text{HI}} = 2619 \text{ km s}^{-1}$, $W_{20} = 502 \text{ km s}^{-1}$, and $S = 7.6 \text{ Jy km s}^{-1}$ while Huchtmeier (1997) reports $V_{\text{HI}} = 2850 \text{ km s}^{-1}$, $W_{20} = 159 \text{ km s}^{-1}$, and $S = 1.7 \text{ Jy km s}^{-1}$; based on Green Bank 140-ft observations, Richter et al. (1994) find $V_{\text{HI}} = 2772 \text{ km s}^{-1}$, $W_{20} = 164 \text{ km s}^{-1}$, and $S = 2.95 \text{ Jy km s}^{-1}$. A comparison with these 3 past observations suggests that the second portion of the HI line detected in our spectrum is due to a confusion with NGC 2865, while the first portion of the line corresponds to a detection of FGCE 745 itself. For the second feature we measure $V_h = 2766 \text{ km s}^{-1}$, $W_{20} = 184 \text{ km s}^{-1}$, and $S \geq 1.47 \text{ Jy km s}^{-1}$. The presence of a highly flattened galaxy so near a large elliptical is surprising, although the DSS image of FGCE 745 shows hints of disturbance to its stellar disk.

UGC 5289 On the DSS, UGC 5289 is seen to be superposed on a diffuse, face-on spiral; this existence of this pair was noted in the UGC catalogue, but was designated by a single UGC number (Nilson 1973); a physical association between the galaxies is unlikely, but it is uncertain which of the two we have detected.

UGC 5301 The Sb spiral UGC 5295 is located 4'.8 from UGC 5301 with $V_h = 4790 \text{ km s}^{-1}$, $W_{20} = 307 \text{ km s}^{-1}$, and $S = 19.6 \text{ Jy km s}^{-1}$ (Haynes et al. 1988). However the velocity and linewidths measured for this target are consistent with the optical measurements of UGC 5301 obtained by Makarov et al. (1999) $V_h = 4873 \text{ km s}^{-1}$ and $V_{\text{max}} = 118 \text{ km s}^{-1}$, indicating that our HI profile is unlikely to be confused.

FGC 969 Although our detection is weak, its validity was reconfirmed by Giovanelli et al. (1997).

ESO 435–044 An additional narrow peak is visible in our spectrum near $V_h \sim 1219 \text{ km s}^{-1}$. This may correspond to a detection of the dwarf ESO 435–045 located 7'.1 from ESO 435–044 which has no previously reported redshift.

FGC 1028 Our detected HI feature is rather weak, but its velocity agrees with the optical redshift of $V_h = 3168 \text{ km s}^{-1}$ reported for FGC 1028 by Makarov et al. (1999).

ESO 569–003 ESO 569–003 has an uncatalogued companion visible on the DSS, but our HI profile shows no evidence of a second source.

ESO 377–007 Both ESO 377–007 and the Sa-b spiral ESO 377–006 (redshift unknown), 3'.5 away were contained in our beam, hence it is uncertain as to which galaxy we have detected.

FGC 1204 Several other catalogued galaxies without known redshifts are also present in this region, including the triple system CGCG 242–008, 8'.7 from FGC 1204, making the source of our detected line profile uncertain.

FGC 1227 Our derived radial velocity for FGC 1227 is somewhat lower than the value of $V_h = 4777 \text{ km s}^{-1}$ derived optically by Makarov et al. (1999).

UGC 6519 Our detection of UGC 6519 appears rather marginal, but its validity was reconfirmed by Giovanelli et al. (1997).

FGC 1282 Both FGC 1282 and the Sbc spiral NGC 3739, 5'8 away were present in our beam, and neither has a published redshift. Based on our observed linewidths and integrated fluxes, we believe our lower velocity detection to correspond to FGC 1282 and our higher-velocity detection to NGC 3739. However, an additional uncatalogued galaxy was also present in our beam.

FGC 1348 Two spiral-like HI profiles are detected in our observations, although FGC 1348 has no companions visible on the DSS. We find no evidence of RFI in individual scans.

UGC A266 UGC A266 was included in our survey since it was listed in the LEDA database as an Im galaxy with an angular size of $6'.9 \times 0'.6$ (see also Nilson 1974) and therefore met our axial ratio selection criterion. However examination of the DSS and subsequent CCD imaging by Matthews et al. (unpublished) show that the only object near the catalogued position is an extremely diffuse irregular galaxy with an angular diameter of $\sim 1'$. It is displaced by roughly $27''.5$ to the west and $31''.6$ to the south of its original catalogued position of $\alpha = 11^h59^m54^s$, $\delta = -14^\circ15'00''$ (B1950.0). The coordinates and optical diameter listed in Table 1 were measured from the *R*-band CCD image of Matthews et al. We measured a position angle of 155° for UGC A266 from this image. A faint, uncatalogued dwarf companion is also visible $\sim 3'.5$ away.

FGC 1394 UGC 7272 (FGC 1392) located $13'.2$ away from FGC 1394 was also present in our beam, but it does not have a published redshift. Both it and FGC 1394 have similar apparent magnitudes, surface brightnesses and angular sizes; it is therefore uncertain which of these objects we have detected.

UGC 7844 A second marginal feature is seen in our spectrum with $V_h \sim 3662 \text{ km s}^{-1}$, $W_{20} \sim 311 \text{ km s}^{-1}$, and $S \sim 2.3 \text{ Jy km s}^{-1}$.

FGC 1496 The second source detected in our spectrum at $V_h = 1443 \text{ km s}^{-1}$ is likely to be DDO 142, an Sdm spiral $9'.2$ from FGC 1496 with a previously known redshift (Da Costa et al. 1998).

FGC 1519 The feature seen in our spectrum at $V_h = 1262 \text{ km s}^{-1}$ appears to be due to NGC 4781, an Sd spiral $19'.4$ away (Richter & Huchtmeier 1987). An additional marginal feature is also seen near the edge of our bandpass with $V_h \geq 5261 \text{ km s}^{-1}$, $W_{20} \geq 102 \text{ km s}^{-1}$ and $S \geq 0.62 \text{ Jy km s}^{-1}$.

FGC 1530 An optical redshift obtained by Grogin et al. (1998) confirms that the dwarf-like HI profile that we observe does indeed correspond to FGC 1530.

FGC 1633 The Sd spiral FGC 1635, $9'.3$ away (redshift unknown) may also have been present in our beam.

UGC 8590 Our detection of UGC 8590 appears marginal, but its validity was reconfirmed by Giovanelli et al. (1997).

UGC 9377 Our detection of UGC 9377 appears rather marginal, but the redshift of this galaxy was reconfirmed optically by Makarov et al. (1997a).

FGC 1845 MCG-02-38-030 (classified as an Sa spiral) is located only $2'.9$ from FGC1845, and has an optical redshift of $V_h = 2710 \text{ km s}^{-1}$ (Da Costa et al. 1998). However, no HI detection has ever been reported for this source; moreover, an *R*-band CCD image (Matthews et al. unpublished) reveals that MCG-02-38-030 is actually an elliptical or S0, and hence it may be gas-poor. Because our detected line profile is double-horned, centered at a slightly lower velocity, and is of a width expected for an edge-on Sd galaxy, we believe our detection of FGC 1845 is real and not due to a confusion. Nonetheless, given the unperturbed optical morphology of FGC 1845, the proximity of these two objects is surprising.

FGC 1895 An additional marginal source was also detected in our spectrum near $V_h \sim 1967 \text{ km s}^{-1}$ with $W_{20} \sim 138 \text{ km s}^{-1}$ and $S \sim 0.64 \text{ Jy km s}^{-1}$; this feature is possibly due to RFI.

FGC 1931 Makarov et al. (1999) reported an optically-derived recessional velocity for FGC 1931 of $V_h = 6089 \text{ km s}^{-1}$.

UGC 10004 FGC 1947 may have overlapped in our beam. A second marginal feature at $V_h \sim 6994 \text{ km s}^{-1}$ with $W_{20} \sim 147 \text{ km s}^{-1}$ and $S \sim 0.77 \text{ Jy km s}^{-1}$ was also detected.

UGC 10369 No obvious optical counterpart for the second source detected in our spectrum can be found on the DSS.

UGC 11243 The Sab spiral UGC 11246 is $4'.2$ from UGC 11243, at $V_h = 4071 \text{ km s}^{-1}$ (Theureau et al. 1998). The line width and systemic velocity of our observed line profile suggest our detection is not due to a confusion, although the line profile may be partially blended. UGC 11243 thus appears to be part of a loose group of galaxies, together with UGC 11246 and NGC 6641.

FGC 2264 Our 3-peaked line profile may result from a blend between the peculiar ring galaxy MCG-02-50-008, ($12'.8$ away, with an optical redshift of $V_h = 5996 \text{ km s}^{-1}$, Fisher et al. 1995) and the HI emission from FGC2264 itself at a similar velocity. However, MCG-02-50-008 has no previously reported detection in HI.

FGC 2277 A second marginal feature was also detected in our spectrum with $V_h \sim 4170 \text{ km s}^{-1}$, $W_{20} \sim 85 \text{ km s}^{-1}$, and $S \sim 0.66 \text{ Jy km s}^{-1}$. A possible uncatalogued dwarf counterpart is visible on the DSS.

FGC 2299 No obvious optical counterpart for the second detected HI source is visible on the DSS.

UGC 11666 UGC 11666 is actually a galaxy pair comprised of an edge-on Sdm galaxy and another spiral viewed close to face-on. The face-on system has an optically-derived radial velocity $V_h = 9938 \text{ km s}^{-1}$ (RC3), and we have detected this galaxy in our HI spectrum, near the edge of our bandpass; we measure $V_h \approx 9935 \text{ km s}^{-1}$, $W_{20} \approx 362 \text{ km s}^{-1}$, and $S \gtrsim 1.80 \text{ Jy km s}^{-1}$. We believe the lower-velocity HI source we detected to correspond to the Sdm component of UGC 11666, making the UGC 11666 system physically unassociated.

FGC 2303 Our detected line profile has a surprisingly low redshift and narrow velocity width for this rather small angular size Sd. However, the DSS reveals no obvious candidates for interlopers.

ESO 342–017 Our H I detection appears marginal, but it corresponds closely with the optical recessional velocity $V_h = 7680 \text{ km s}^{-1}$ reported for ESO 342–017 by Mathewson & Ford (1996).

FGC 2323 Although our line profile appears rather marginal, the validity of our detection was reconfirmed by Giovanelli et al. (1997).

ESO 467–063 An Irr galaxy ESO 467–062 is located 9/6 from ESO 467–063, with an optical redshift of $V_h = 4055 \text{ km s}^{-1}$ (Da Costa et al. 1998), although it should have been outside our beam. No detection of ESO 467–062 in H I has previously been reported, and our detection of ESO 467–063 shows no signature of confusion.

FGC 2468 No obvious optical counterpart for the second detected H I source is visible on the DSS.

FGC 2495 Giovanelli et al. (1997) report $V_h = 8272 \text{ km s}^{-1}$, $W_{20} = 379 \text{ km s}^{-1}$, and $S_{\text{cor}} = 1.47 \text{ Jy km s}^{-1}$ for FGC 2495. We can identify no obvious cause for the discrepancy with our measured parameters from a comparison with their (unpublished) spectrum.

UGC 12659 Our detected line profile is peculiar and has the appearance of a blended detection, although the only optically identified galaxy in our beam was UGC 12656 with a previously known redshift of $z = 0.03440$ (Huchra et al. 1999).

FGC 2548 A second feature appears in our spectrum near $V_h = 1069 \text{ km s}^{-1}$; this is likely an artifact of structure in the bandpass (see Sect. 3.1.1) or interference.

Appendix B: Notes to Table 2

FGC 242 Our lower-velocity detection is likely due to a confusion with IC 200, 5/1 away at $V_h = 3846 \text{ km s}^{-1}$ (RC3); our weak higher-velocity detection may be due to interference.

FGC 245 Our detection is likely a spurious feature due to recurrent bandpass structure (see Sect. 3.1.1).

FGC 284 Our apparent detection is likely due to a confusion with CGCG 462–006, at $V_h = 4100 \text{ km s}^{-1}$ (Giovanelli & Haynes 1993) and with a projected distance of 10/7 from FGC 284.

FGC 511 Our detection may result from confusion with the Sb spiral NGC 1681, located 8/7 away, with $V_h = 2751 \text{ km s}^{-1}$ (Huchra et al. 1993), although that galaxy has no published H I detection. In observations obtained with a higher-velocity search range, a second marginal detection is present at the edge of the bandpass, near $V_h \sim 10095 \text{ km s}^{-1}$, with $W_{20} \gtrsim 137 \text{ km s}^{-1}$ and $S \gtrsim 0.60 \text{ Jy km s}^{-1}$.

FGC 567 We see marginal features near $V_h \sim 5300 \text{ km s}^{-1}$ in spectra obtained using two different autocorrelator configurations, but both features are quite weak.

FGC 598 The optical counterpart of FGC 598 appears extraordinarily diffuse and of low surface brightness on the DSS. The line we detect is likely a result of confusion with the Sa galaxy UGC 3679, 8/5 away at $V_h = 5831 \text{ km s}^{-1}$ (RC3) and/or the Sb spiral CGC 205–017, 9/2 away, at $V_h = 5751 \text{ km s}^{-1}$ (Marzke et al. 1996), although CGCG 205–017 has no previously reported H I detection. An additional marginal detection is present in our spectrum at $V_h \sim 7246 \text{ km s}^{-1}$ with $W_{20} \sim 180 \text{ km s}^{-1}$ and $S \sim 0.76 \text{ Jy km s}^{-1}$.

FGC 613 Our possible detection of FGC 613 is not corroborated by Giovanelli et al. (1997), who report $V_h = 7310 \text{ km s}^{-1}$ for FGC 613. One possibility is that their detection resulted from a confusion with the Sab spiral UGC 3774 ($V_h = 7242 \text{ km s}^{-1}$; RC3), 4/6 from FGC 613, as the peak flux they report for FGC 613 should have been well above our detection limit.

UGC 3716 Our detected line profile is peculiar, probably due to a blended detection. A number of galaxies with redshifts similar to our detected line are present in this region, and two of these galaxies would have overlapped in our beam: UGC 3718, with $V_h = 6208 \text{ km s}^{-1}$, 1/4 away, and CGC 205–025 with $V_h = 6257 \text{ km s}^{-1}$, 8/1 away. Their redshifts were determined optically (Marzke et al. 1996), but both have early-type morphologies and neither has previously been detected in H I, hence it is unknown whether we have detected one of these objects, or whether UGC 3716 is an H I-rich member of this group.

FGC 904 Our observations may be contaminated by the Sa spiral NGC 2907 lying 5/6 away with $V_h = 2090 \text{ km s}^{-1}$, $W_{20} = 510 \text{ km s}^{-1}$, and $S = 6.1 \text{ Jy km s}^{-1}$ (Richter & Huchtmeier 1987).

UGC 5550 Our detected H I feature is quite weak, although its velocity is close to the optical redshift of $V_h = 4475 \text{ km s}^{-1}$ reported by Makarov et al. (1999).

FGC 1248 The weak feature we observe does not correspond in velocity to the optical redshift of $V_h = 9897 \text{ km s}^{-1}$ measured for FGC 1248 by Makarov et al. (1999); no H I line feature is apparent in our spectrum near the Makarov et al. velocity.

FGC 1359 Our marginal detection may be due to contamination from the E? galaxy MCG-01-31-003, 2/4 away, with $V_h = 5589 \text{ km s}^{-1}$ (Da Costa et al. 1998), although MCG-01-31-003 has no previously reported detection in H I.

FGC 1563 A matching off-beam feature suggests the emission feature may be due to interference.

ESO 576–047 Our detection is very near the edge of the bandpass and may be spurious.

UGC 7553 Our line profile is likely blended or confused with the S0 galaxy CGCG014-041 9/8 away at $V_h = 8800 \text{ km s}^{-1}$ (Metcalfe et al. 1989), although CGCG 014–041 has no previously reported reported detection in

H1. We also marginally detect an additional source at $V_h \sim 4905 \text{ km s}^{-1}$ with $W_{20} \sim 413 \text{ km s}^{-1}$ and $S \sim 1.3 \text{ Jy km s}^{-1}$.

UGC 8538 A strong off-beam detection or interference overlaps with our observed line profile, hence our source flux and linewidth are lower limits, making the validity of our detection questionable. The off-beam source appears strong and narrow, and no optical catalogued galaxy appears at the location of the off-beam observations; however both the on- and off-beam sources were present in observations obtained on four different days over a one-month period.

FGC 1793 Our lower-velocity detection is likely due to confusion with the dwarf ESO 580–008, 9'1 from FGC 1793, with $V_h = 3437 \text{ km s}^{-1}$ (Maia et al. 1993); the second source is likely a confusion with the SBc spiral NGC 5716, 9'7 away, with $V_h = 4119 \text{ km s}^{-1}$ (RC3).

FGC 1903 Our detection appears to be due to a confusion with UGC 9855, an Im galaxy 4'4 from FGC 1903 with $V_h = 3480 \text{ km s}^{-1}$ (Schneider et al. 1992).

FGCE 1446 Inspection of the DSS reveals a number of other galaxies present in our beam, including the Sb spiral ESO 596–010 at $V_h = 4732 \text{ km s}^{-1}$, 8'8 away (Fisher et al. 1995). Our detection is likely due to a confusion with this galaxy, although ESO 596–010 has not been previously detected in H I.

ESO 342–044 This region contains a galaxy group, and numerous other galaxies were present in our beam, including ESO 342–045, a spiral with $V_h = 4960 \text{ km s}^{-1}$ (RC3), 7'0 from ESO 342–044. Our H I detection is mostly likely due to a confusion with this object.

FGC 2506 A marginal feature is seen at the edge of our bandpass; if real, it may correspond to either a detection of FGC 2506, or to UM165m, a galaxy 2'2 away with $V_h = 5096 \text{ km s}^{-1}$ (Terlevich et al. 1991) but with no previously reported H I detection.

Appendix C: Notes to Table 3

FGC 362 We were unable to reconfirm the detection of FGC 362 at $V_h = 6472 \text{ km s}^{-1}$ reported by Giovanelli et al. (1997).

FGC 477 See note for FGC 476 in Appendix A.

FGC 522 No optical counterpart exists on the DSS at the catalogued position of FGC 522, and this object was subsequently excluded from the Revised FGC (Karachentsev et al. 1999). The nearest galaxy to this position on the DSS is FGC 524, 5'9 away.

FGC 1966 We find no H I feature coinciding with the optically-derived redshift of $V_h = 8434 \text{ km s}^{-1}$ reported for FGC 1966 by Makarov et al. (1999).

FGC 2357 We were unable to reconfirm the detection of FGC 2357 at $V_h = 8163 \text{ km s}^{-1}$ reported by Giovanelli et al. (1997).

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