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Hα surface photometry of galaxies in the Virgo cluster

II. Observations with the OHP and Calar Alto 1.2 m telescopes⋆,⋆⋆

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Abstract. We present Hα line imaging observations of 122 galaxies obtained with the 1.20 m telescopes of the Observatoire de Haute Provence (OHP) and of Calar Alto. The observed galaxies are mostly Virgo cluster members (95), along with 10 objects in the Coma/A1367 supercluster, 6 in the clusters A2197 and A2199, and 11 nearby galaxies taken as fillers. Hα+[NII] fluxes and equivalent widths, as well as images of all the detected targets, are presented.

Key words. galaxies: photometry – galaxies: fundamental parameters

1. Introduction

The star-formation activity is a fundamental parameter in the study of the formation and evolution of galaxies. Being linearly related to the number of young O-B massive stars, the Hα line emission is the most direct tracer of star formation in normal, late-type galaxies (Kennicutt 1998). In order to study the star formation history of objects of different mass, luminosity, type and belonging to different environments (cluster, field), we are gathering Hα data for a large sample of galaxies in the nearby Universe for which data at other wavelengths are already available. We focused our attention on the closest rich cluster of galaxies, the Virgo cluster, for which Hα data of galaxies spanning the whole range in luminosity and morphological type, from giant early spirals to dwarfs irregulars and BCDs, can be easely obtained with 2 m class telescopes.

In this paper we present new Hα surface photometry of late-type galaxies in the Virgo cluster obtained with the 1.20 m telescope at the Observatoire de Haute Provence and with the 1.23 m telescope at Calar Alto. In a companion paper (Gavazzi et al. 2002, Paper I), we present similar observations of lower luminosity Virgo galaxies carried out with the San Pedro Martir 2.1 m telescope. In a third paper (Boselli et al. 2002, Paper III) we present Hα observations of blue compact galaxies carried out at the INT and NOT telescopes in La Palma. The data were jointly discussed in Boselli et al. (2001), Boissier et al. (2001) and will be further discussed in a future communication (Gavazzi et al. in preparation, Paper IV).

2. The sample

Galaxies observed in this work have been selected from the Virgo Cluster Catalogue (VCC) of Binggeli et al. (1985), which is complete to the optical B magnitude $m_{\rm pg} = 18.0$. The targets were selected according to the following criteria:

- $m_{\rm pg} < 16.0$;
- Hubble type later than S0a;
- classified as cluster members, possible members or belonging to the W, W', M clouds or to the southern extension (Binggeli et al. 1985; 1993).

Among the 312 late-type Virgo cluster members matching these criteria, 235 objects (75%) either included in the present work or in Papers I and III have an Hα measurement. Moreover limiting to the ISO sample described in Boselli et al. (1997a), 86 out 88 galaxies (98%) have Hα data. Given the large field of view of the detectors, some galaxies not matching the selection criteria were serendipitously observed in the fields of other targets.

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⋆ Based on observations taken at the Observatoire de Haute Provence (OHP) (France), operated by the French CNRS, and Calar Alto Observatory (Spain), operated by the Max-Planck-Institut für Astronomie (Heidelberg) jointly with the Spanish National Commission for Astronomy.

⋆⋆ Figure 1 is only available in electronic form at http://www.edpsciences.org

Few galaxies in the Coma/A1367 supercluster and in A2197 and A2199 were also observed as fillers, as well as a few nearby objects.

The target galaxies, as well as the serendipitously observed objects, are listed in Table 1, arranged as follow:

- Column 1: VCC designation, from Binggeli et al. (1985) for Virgo galaxies, or CGCG (Zwicky et al. 1961–68) for Coma supercluster and A2197 and A2199 galaxies;
- Column 2: NGC/IC name;
- Column 3: UGC name (Nilson 1973);
- Columns 4 and 5: (B1950.0) celestial coordinates, from NED;
- Columns 6 and 7: major an minor optical diameters. For VCC galaxies the diameters are measured on the du Pont plates at the faintest detectable isophote. For CGCG galaxies these are the major and minor optical diameters (a_{25}, b_{25}) (in arcmin) derived as explained in Gavazzi & Boselli (1996);
- Column 8: heliocentric velocity, in km s^{-1}, from the VCC or from Gavazzi et al. (1999b);
- Column 9: cluster membership as defined in Gavazzi et al. (1999a) for Virgo and in Gavazzi et al. (1999b) for the Coma/A1367 supercluster;
- Column 10: distance, in Mpc. Distances to the various substructures of Virgo are as given in Gavazzi et al. (1999a). A distance of 96, 125, 122 Mpc is assumed for galaxies in the Coma, A2197 and A2199 clusters respectively. For galaxies not belonging to the clusters, the distance is determined from the redshift assuming $H_0 = 75$ km s^{-1} Mpc^{-1};
- Column 11: angular distance from the cluster centre, in degrees;
- Column 12: morphological type as given in the VCC or in Gavazzi & Boselli (1996);
- Column 13: photographic magnitude;
- Column 14: optical magnitude determined and corrected for dust extinction as described in Gavazzi & Boselli (1996);
- Column 15: total extrapolated H band magnitude, uncorrected for extinction, determined as described in Gavazzi et al. (2000).

For the nearby galaxies, Table 2 lists the relevant informations taken from NED[1].

3. Observations

Narrow band imaging in the Hα emission line (λ = 6562.8 Å) of galaxies was obtained in 1998 and 2000 at the 1.20 m Newton telescope of the Observatoire de Haute Provence (OHP; France) and in 1999 at the 1.23 m telescope of Calar Alto (Spain). The $f/6$ OHP telescope is equipped with a thinned TK1024 × 1024 pixels CCD detector. The pixel size is 0.69 arcsec. At the adopted gain, the electron/adu conversion is 3.5 e$^-$/adu, with a readout noise of 8.5 e$^-$. The $f/8$ Calar Alto telescope is equipped with a SITe 2048×2048 pixel CCD detector. The pixel size is 0.50 arcsec. At the adopted gain, the electron/adu conversion is 3.5 e$^-$/adu, with a readout noise of 5.2 e$^-$. A total of 26 nights at the OHP and 8 at Calar Alto were allocated to this project. Of these, 22 were totally or partly useful due to technical problems or weather limitations, as reported in Table 3 (logbook of the observations and CCD technical data).

Each galaxy was observed through two narrow band interferometric filters (see Table 4), one of them including the redshifted Hα line (ON) and the second one mesuring the red continuum near Hα (OFF). The filters given in Table 4 are used as ON or OFF band for each target, as specified in Cols. 2 and 3 of Table 5. The flux from the [NII] emission lines at λ6548 Å and λ 6584 Å is included in the ON band observations. The tipical integration time was of 30–45 min ON- and OFF-band, generally split in 3 shorter exposures. Observations were obtained during poor seeing conditions (2–4 arcsec), expecially at the OHP. The images of a few nearby galaxies have been obtained by mosaicing several frames: M 81 (6 positions), M 106 (2 positions) and NGC 2403 (5 positions).

The observations were calibrated using the standard stars Feige 34 and Hz44 from the catalogue of Massey et al. (1988). Observations of the standard stars were repeated every 2 hours, with an integration of 2 min with the telescope defocused to avoid saturation. Repeated measurements gave <0.05 mag differences, which we assume as the typical uncertainty of the photometry given in this work. Not all frames were obtained in photometric conditions. When the zero point was varying by more than 0.1 mag due to cirrus, we choose to observe only galaxies with could be calibrated a posteriori on available photometry. The determination of the Hα equivalent width can however be achieved also in non photometric conditions using field stars to normalize the ON and OFF band images, as described in the next section and in Paper I.

4. Image analysis

The data reduction of the CCD images follows a procedure identical to the one described in previous papers of the series (Gavazzi et al. 1998 Paper I), based on IRAF/ STSDAS[2] data reduction packages. To remove the

[1] This research has made use of the NASA/IPAC Extragalactic Database (NED) which is operated by the Jet Propulsion Laboratory, California Institute of Technology, under contract with the National Aeronautics and Space Administration.

[2] IRAF is the Image Analysis and Reduction Facility made available to the astronomical community by the National Optical Astronomy Observatories, which are operated by AURA, Inc., under contract with the U.S. National Science Foundation. STSDAS is distributed by the Space Telescope Science Institute, which is operated by the Association of Universities for Research in Astronomy (AURA), Inc., under NASA contract NAS 5–26555.

Table 1. The target galaxies.

Virgo														
VCC (1)	NGC/IC (2)	UGC (3)	RA(1950) (4)	Dec (5)	a (6)	b (7)	Vel (8)	Clust (9)	Dist (10)	θ (11)	Type (12)	m_{pg} (13)	B_T^0 (14)	H_T (15)
67	3044	7216	121 015.5	141 515.0	2.26	0.79	-183	M	32	4.66	Sc	13.98	13.62	11.27
87	-	-	121 108.2	154 354.0	1.45	0.72	-134	N	17	5.17	Sm	15.00	15.27	13.64
92	4192	7231	121 115.5	151 042.0	9.78	2.60	-135	N	17	4.84	Sb	10.92	9.87	7.07
145	4206	7260	121 244.0	131 807.0	5.10	0.85	702	N	17	3.84	Sc	12.77	11.70	9.62
152	4207	7268	121 257.3	95 149.0	1.96	0.89	592	N	17	4.69	Scd	13.48	12.98	9.77
159	-	-	121 308.4	83 348.0	1.04	0.52	2584	W	32	5.54	Im	15.08	16.02	13.20
165	-	-	121 320.5	132 937.0	1.25	0.85	255	N	17	3.73	S0	14.87	15.51	11.54
167	4216	7284	121 321.5	132 540.0	9.12	2.16	140	N	17	3.72	Sb	10.97	9.89	6.69
222	4235	7310	121 436.7	72 809.0	4.33	0.71	2410	W	32	6.19	Sa	12.62	11.72	8.73
234	4241	7319	121 452.6	65 804.0	3.36	1.87	2237	W	32	6.59	Sa	12.99	12.69	9.23
267	3115	7333	121 526.7	65 553.0	2.01	2.01	733	B	23	6.55	Sbc	13.82	14.06	10.87
307	4254	7345	121 617.0	144 139.0	6.15	5.60	2405	N	17	3.55	Sc	10.43	10.41	7.21
315	-	-	121 627.3	62 220.0	1.10	0.67	1612	W	32	6.94	Sa	14.98	-	-
341	4260	7361	121 649.0	62 234.0	3.52	1.75	1958	B	23	6.90	Sa	12.70	12.43	8.72
371	4268	7371	121 713.9	53 340.0	1.84	0.57	2377	W	32	7.61	S0	13.73	13.70	9.81
375	4270	7376	121 715.4	54 431.0	2.16	1.00	2494	W	32	7.44	S0	13.11	13.13	9.29
382	4273	7380	121 722.7	53 713.0	2.01	1.29	2378	W	32	7.55	Sc	12.37	12.11	9.34
386	4277	-	121 730.5	53 707.0	1.55	0.97	2499	W	32	7.54	Sa	14.47	14.22	10.80
408	4281	7389	121 748.4	53 951.0	3.36	1.16	2711	W	32	7.47	S0	12.27	12.18	7.84
446	-	-	121 824.6	63 654.0	0.85	0.43	825	B	23	6.52	Im/BCD	15.50	-	13.40
483	4298	7412	121 900.5	145 301.0	3.60	2.01	1136	A	17	3.16	Sc	12.08	11.59	8.49
497	4302	7418	121 910.1	145 230.0	6.74	1.60	1150	A	17	3.13	Sc	12.55	11.33	8.15
524	4307	7431	121 933.0	91 917.0	3.95	0.72	1092	B	23	3.98	Sbc	12.79	12.08	9.52
559	4312	7442	121 959.3	154 852.0	5.10	1.24	153	A	17	3.74	Sab	12.56	11.92	8.99
570	4313	7445	122 006.1	120 442.0	5.10	1.16	1443	A	17	2.09	Sab	12.73	11.65	8.81
596	4321	7450	122 022.9	160 558.0	9.12	8.11	1575	A	17	3.93	Sc	10.11	9.93	6.69
608	4322	-	122 029.7	161 058.0	1.25	0.62	1803	A	17	3.99	dE	14.94	15.24	11.78
630	4330	7456	122 044.6	113 845.0	5.86	1.45	1564	A	17	2.11	Sd	13.10	12.97	9.77
634	4328	-	122 048.0	160 548.0	1.65	1.28	499	A	17	3.88	dE	14.14	14.46	10.94
641	-	-	122 055.3	60 537.0	0.73	0.24	906	B	23	6.82	BCD	15.08	-	13.87
656	4343	7465	122 105.9	71 352.0	2.48	0.93	1014	B	23	5.72	Sb	13.14	12.73	9.34
657	4342	7466	122 106.6	71 954.0	1.55	0.47	714	B	23	5.62	S0	13.54	13.24	9.10
664	3258	7470	122 112.1	124 520.0	2.60	1.87	-427	A	17	1.73	Sc	13.50	13.36	11.98
672	4341	7472	122 120.4	72 300.0	1.87	0.43	934	B	23	5.56	S0	14.21	14.22	10.81
697	3267	7474	122 132.7	71 906.0	1.55	1.55	1231	B	23	5.60	Sc	14.17	14.03	11.05
792	4380	7503	122 249.6	101 738.0	3.52	1.75	971	B	23	2.73	Sab	12.36	12.02	8.55
794	-	7504	122 250.4	164 224.0	1.71	0.43	918	A	17	4.25	dS0	15.50	-	12.56
797	-	-	122 252.8	182 506.0	0.68	0.45	773	A	17	5.90	dE	17.00	16.91	-
798	4382	7508	122 252.8	182 760.0	5.86	3.36	760	A	17	5.94	S0	10.09	10.17	6.55
801	4383	7507	122 253.8	164 449.0	2.60	1.29	1710	A	17	4.28	?	12.68	12.74	9.63
836	4388	7520	122 314.5	125 617.0	5.10	1.24	2515	A	17	1.26	Sab	11.83	10.98	8.26
857	4394	7523	122 324.3	182 926.0	3.60	3.60	914	A	17	5.94	Sb	11.76	11.91	8.24
865	4396	7526	122 327.5	155 649.0	3.36	1.00	-124	A	17	3.48	Sc	13.02	12.24	10.33
873	4402	7528	122 335.3	132 320.0	3.95	1.16	234	A	17	1.36	Sc	12.56	11.74	8.58
874	4405	7529	122 335.5	162 728.0	1.89	1.11	1738	A	17	3.96	Sc	12.99	12.70	9.61
905	-	7537	122 356.6	90 853.0	2.79	2.79	1290	B	23	3.68	Sc	13.42	13.60	11.07
912	4413	7538	122 400.1	125 316.0	2.92	1.75	105	A	17	1.07	Sbc	12.97	12.68	9.84
916	-	-	122 401.1	130 111.0	0.43	0.37	1349	A	17	1.10	dE	16.04	16.35	12.36
939	4411b	7546	122 414.7	90 940.0	3.45	3.45	1271	B	23	3.65	Sc	12.92	12.97	10.53
958	4419	7551	122 424.6	151 924.0	3.52	1.39	-273	A	17	2.82	Sa	12.13	11.66	8.03
979	4424	7561	122 439.2	94 151.0	4.33	2.16	438	B	23	3.10	Sa	12.32	12.05	9.08
984	4425	7562	122 441.3	130 041.0	2.99	1.00	1883	A	17	0.94	Sa	12.82	12.33	9.60
995	3371	7565	122 449.3	110 831.0	1.53	0.11	928	A	17	1.75	Sc	15.32	13.46	13.00
1002	4430	7566	122 453.5	63 220.0	3.02	2.69	1450	B	23	6.19	Sc	12.48	12.65	9.60
1003	4429	7568	122 454.1	112 305.0	8.12	3.52	1130	A	17	1.53	S0a	11.15	10.58	7.03
1145	4457	7609	122 626.0	35 051.0	2.92	2.92	884	SE	17	8.83	Sb	11.66	11.69	7.96
1182	4465	-	122 651.0	81 812.0	0.65	0.32	7368	back	98	4.38	Sc	15.10	15.50	-
1189	3414	7621	122 656.1	70 247.0	1.84	1.07	597	SE	17	5.63	Sc	13.70	13.62	11.40
1190	4469	7622	122 655.5	90 134.0	4.33	1.29	508	B	23	3.66	Sa	12.22	11.84	8.27
1192	4467	-	122 657.8	81 613.0	0.73	0.47	1474	SE	17	4.41	E	15.04	15.28	10.97
1203	-	-	122 704.8	81 236.0	0.65	0.65	948	SE	17	4.47	S0	15.70	16.34	12.72
1205	4470	7627	122 705.3	80 559.0	1.84	1.15	2339	SE	17	4.58	Sc	13.04	12.81	10.22
1375	-	7668	122 906.2	412 56.0	4.76	3.77	1732	SE	17	8.45	Sc	12.00	11.80	11.17
1401	4501	7675	122 927.5	144 143.0	7.23	3.86	2284	A	17	2.05	Sbc	10.27	10.13	6.60
1412	4503	7680	122 934.2	112 708.0	4.33	1.71	1342	A	17	1.25	Sa	12.12	11.73	8.28
1419	4506	7682	122 938.9	134 143.0	2.16	1.29	737	A	17	1.08	S..	13.64	13.59	10.38
1450	3476	7695	123 010.5	141 929.0	2.60	2.01	-173	A	17	1.72	Sc	13.29	13.24	10.96
1453	3478	7696	123 012.8	142 819.0	1.15	0.89	1949	A	17	1.86	dE	14.34	14.74	11.59
1486	3483	-	123 038.1	113 722.0	1.10	0.78	129	A	17	1.19	S..	15.30	14.84	12.05
1507	-	-	123 056.4	40 412.0	1.16	0.57	910	SE	17	8.62	Sm	15.08	-	-
1540	4527	7721	123 135.2	25 543.0	5.86	1.87	1736	SE	17	9.77	Sb	11.32	10.63	7.27
1552	4531	7729	123 144.3	132 101.0	4.24	2.42	195	A	17	1.08	Sa	12.58	12.25	8.98
1555	4535	7727	123 148.0	82 826.0	8.33	7.43	1962	SE	17	4.28	Sc	10.51	10.66	7.64
1562	4536	7732	123 153.8	22 750.0	7.23	3.28	1807	SE	17	10.24	Sc	11.01	10.65	7.78
1569	3520	-	123 200.3	134 645.0	1.07	0.71	799	A	17	1.43	Scd	15.00	15.55	13.51
1572	-	-	123 201.8	25 042.0	0.93	0.29	1848	SE	17	9.87	BCD	16.00	16.45	-

Table 1. continued.

VCC (1)	NGC/IC (2)	UGC (3)	RA(1950) (4)	Dec (5)	a (6)	b (7)	Vel (8)	Clust (9)	Dist (10)	θ (11)	Type (12)	$m_{\rm pg}$ (13)	$B_{\rm T}^0$ (14)	$H_{\rm T}$ (15)
1575	3521	7736	123 206.8	72 610.0	2.00	1.41	597	SE	17	5.32	Sm	13.98	13.79	11.23
1588	4540	7742	123 219.5	154 937.0	2.60	1.87	1288	A	17	3.31	Scd	12.81	12.44	9.41
1673	4567	7777	123 401.0	113 159.0	2.92	1.87	2277	A	17	1.80	Sc	12.08	10.83	8.64
1676	4568	7776	123 402.5	113 050.0	5.10	1.75	2255	A	17	1.82	Sc	11.70	10.38	7.70
1678	3576	7781	123 405.1	65 347.0	2.16	1.87	1073	SE	17	5.94	Sd	13.70	14.46	12.47
1690	4569	7786	123 418.5	132 616.0	10.73	5.35	-216	A	17	1.65	Sab	10.25	9.68	7.02
1730	4580	7794	123 515.9	53 836.0	2.16	1.60	1032	SE	17	7.23	Sc	12.61	12.55	8.82
1760	4586	7804	123 555.1	43 537.0	4.33	1.16	792	SE	17	8.29	Sa	12.54	12.15	8.74
1859	4606	7839	123 826.2	121 109.0	5.10	2.01	1645	E	17	2.52	Sa	12.52	12.24	9.30
1868	4607	7843	123 841.0	120 936.0	3.95	0.78	2255	E	17	2.59	Scd	13.75	12.79	9.74
1929	4633	7874	124 006.5	143 748.0	2.48	1.07	291	E	17	3.48	Scd	13.77	13.16	10.75
1931	-	-	124 010.2	133 224.0	1.26	0.70	1100	E	17	3.02	Im	15.20	-	13.04
1932	4634	7875	124 010.2	143 412.0	2.92	0.87	116	E	17	3.45	Sc	13.19	12.30	9.68
1941	-	-	124 018.6	133 354.0	0.32	0.32	1213	E	17	3.06	dE	18.00	-	-
1943	4639	7884	124 021.5	133 152.0	3.20	2.01	1048	E	17	3.06	Sb	12.19	12.12	8.90
2037	-	-	124 343.8	102 848.0	0.88	0.38	1142	E	17	4.37	Im/BCD	15.92	16.20	12.55
2066	4694	7969	124 544.0	111 528.0	3.20	1.16	1181	E	17	4.49	?	12.19	12.29	9.28
14063	4517	7694	123 011.8	2316.0	11.00	2.05	1129	SE	17	12.29	Sc	12.40	10.46	7.61
71060	4746	8007	124 924.6	122 118.0	2.20	0.61	1779	E	17	5.16	Sd	13.30	13.42	9.87

Coma/A1367 supercluster

CGCG	NGC/IC	UGC	RA(1950)	Dec	a	b	Vel	Clust	Dist	θ	Type	$m_{\rm pg}$	$B_{\rm T}^0$	$H_{\rm T}$
160065	-	-	125 605.3	281 703.0	0.90	0.82	7188	A1656	96	0.31	E	15.00	15.01	11.19
160069	3943	-	125 611.5	282 300.0	1.10	0.36	6827	A1656	96	0.32	S0a	15.60	14.87	11.47
160213	4858	-	125 637.3	282 306.2	0.51	0.43	9386	A1656	96	0.24	Pec	15.50	15.65	13.07
160214	-	-	125 637.0	282 941.0	0.88	0.47	8028	A1656	96	0.31	S0	15.30	15.28	11.29
160215	4860	-	125 639.2	282 335.0	0.96	0.80	7966	A1656	96	0.23	E	14.70	14.57	10.59
160216	3955	-	125 641.2	281 559.0	0.71	0.58	7895	A1656	96	0.18	S0	15.60	15.45	11.49
160221	4864	-	125 648.3	281 446.0	1.51	0.81	6760	A1656	96	0.15	E	14.80	14.45	10.82
160222	4867	-	125 650.4	281 424.0	0.64	0.43	4818	A1656	96	0.15	E	15.50	15.45	11.58
161043	5131	8422	132 137.4	311 453.4	1.91	0.38	6638	Isol	88	6.03	Sa	14.40	13.38	10.19
161069	5187	-	132 729.7	312 316.7	0.90	0.77	7172	Isol	96	7.22	Sb	14.60	14.65	11.17

A2197/A2199

CGCG	NGC/IC	UGC	RA(1950)	Dec	a	b	Vel	Clust	Dist	θ	Type	$m_{\rm pg}$	$B_{\rm T}^0$	$H_{\rm T}$
224008	-	362	162 112.6	395 425.0	1.28	0.72	9628	A2199	125	1.14	Sb	15.40	14.50	10.98
224009	-	367	162 133.9	400 206.0	1.23	1.17	9873	A2199	125	1.11	Sb	14.60	14.28	10.93
224037N	-	-	162 645.1	411 639.0	0.80	0.70	9800	A2197	122	0.43	S..	15.50	15.39	11.45
224037S	-	-	162 647.9	411 609.6	0.55	0.50	9489	A2197	122	0.42	S0	15.50	15.64	11.60
224038	-	407	162 648.3	411 938.0	0.77	0.70	8446	A2197	122	0.47	Pec	14.30	14.28	11.86
224046	-	415	162 720.8	412 333.0	1.14	0.91	9401	A2197	122	0.49	Sb	14.80	14.53	11.04

Table 2. The nearby galaxies.

Name	RA(1950)	Dec	a	b	Vel	Type	$m_{\rm pg}$	$B_{\rm T}^0$
M51	132 746.3	472 710.3	11.2	6.9	463	SA(s)bcpec	8.96	8.67
M81	95 127.3	691 808.3	26.9	14.1	−34	SA(s)ab	7.89	7.39
M82	95 143.5	695 500.8	11.2	4.3	203	I0;Sbrst	9.30	8.86
M106	121 629.4	473 453.2	18.6	7.2	448	SAB(s)bc	9.10	8.53
NGC 925	22 417.0	332 116.9	10.5	5.9	553	SAB(s)d	10.69	9.97
NGC1637	43 857.5	−25 711.9	4.0	3.2	717	SAB(rs)c	11.47	11.25
NGC2403	73 202.3	654 250.7	21.9	12.3	131	SAB(s)cd	8.93	8.43
NGC2541	81 101.8	491 251.0	6.3	3.2	559	SA(s)cd	12.26	11.57
NGC2805	91 617.0	641 852.8	6.3	4.8	1730	SAB(rs)d	11.52	11.18
NGC2903	92 920.3	214 321.5	12.6	6.0	556	SB(s)d	9.68	9.11
NGC5195	132 752.5	473 132.0	5.8	4.6	465	SB0pec	10.45	10.45

Table 3. Logbook of the observations.

Telescope	Date	Nights (ass./used)	CCD	Pixel size
1.2 m OHP	25/2–9/3/1998	12/6	TK1024 × 1024	0.690
1.23 m CA	14–21/4/1999	8/4	SITe2048 × 2048	0.502
1.2 m OHP	7–12/2/2000	7/5	TK1024 × 1024	0.690
1.2 m OHP	6–12/3/2000	7/7	TK1024 × 1024	0.690

Table 4. The characteristics of the narrow band filters.

λ	$\Delta\lambda$	$R(\lambda)$	$\int R(\lambda)\mathrm{d}\lambda$	Telescope
6450	45	81	37.80	1.20 m OHP
6561	48	78	38.45	1.20 m OHP
6612	55	68	40.60	1.20 m OHP
6569	113	83	101.00	1.23 m CA
6744	97	80	82.15	1.23 m CA

detector response each image is bias subtracted and divided by the mean of several flat field exposures obtained on the twilight sky. Calar Alto flat fielding is sometimes poor because of filter vignetting. In some cases images were fitted with a 2-D polynomial function to remove second order structures in the image. Vignetting problems, combined with generally shorter exposures, make the Calar Alto images of poorer quality with respect to the OHP ones. When three images in the same filter are available, a median combination of the realigned images allows removal of cosmic rays. For galaxies with only one available image, direct inspection of the frames allows manual cosmic rays removal. Subtraction of contaminating objects, such as nearby stars and galaxies, is done by direct editing of the frames. The sky background is determined in each frame in concentric object-free annuli around the object. The typical uncertainty on the mean background is estimated 10% of the rms in the individual pixels. This represents the dominant source of error in low S/N regions.

Total counts in the two frames have been obtained by integrating the pixel counts over the area covered by each galaxy, as derived by the optical major and minor diameters. Hα+[NII] fluxes and equivalent widths have been determined using Eqs. (1) and (2) given in Paper I.

Equation (2) shows that once the normalization constant $n_{\frac{\rm ON}{\rm OFF}}$ between ON and OFF band frames is known, the Hα+[NII] equivalent width can be estimated also in non photometric conditions. The zero point of each galaxy is determined assuming an extinction law of slope 0.1 for the OHP and 0.12 for the Calar Alto observations respectively.

At the redshift of Virgo the Calar Alto OFF band filter (λ 6744 Å) is partly contaminated by the emission of the [SII] dublet at λ 6717 Å and 6731 Å. We corrected for this effect using Eqs. (3), (4) and (5) given in Paper I.

Errors on the Hα+[NII] flux and EW are estimated from Eqs. (6) and (7) of Paper I.

5. Results

The results of the present observations are listed in Table 5, arranged as follow:

- Column 1: galaxy name;
- Column 2 and 3: ON and OFF band filters;
- Column 4: telescope used;
- Column 5: year of the observation;
- Column 6: integration time per filter;
- Column 7: transmissivity of the filter at the redshifted Hα line;
- Column 8: Normalization factor obtained by dividing the flux of several field stars in the ON band frame to the OFF band frame, $n_{\frac{\rm ON}{\rm OFF}}$. In photometric conditions this quantity gives the transmission difference between the ON and the OFF band filters. Under non photometric conditions $n_{\frac{\rm ON}{\rm OFF}}$ includes variations in the sky transparency. The average values $n_{\frac{\rm ON}{\rm OFF}}$ obtained in photometric conditions are $n_{\frac{6561}{6450}} = 1.00 \pm 0.03$, $n_{\frac{6612}{6561}} = 1.15 \pm 0.03$, $n_{\frac{6612}{6450}} = 1.10 \pm 0.02$ and $n_{\frac{6569}{6744}} = 1.18 \pm 0.03$;
- Column 9: the correction factor for [SII] contamination K (Calar Alto observations of Virgo galaxies) defined in Eq. (3) of Paper I ($K = 1.00$ for no correction);
- Column 10: Hα+[NII] equivalent width (Hα + [NII]EW), and error, in Å;
- Column 11: log of the Hα+[NII] flux and error, in erg cm^{-2} s^{-1}, uncorrected for underlying Balmer absorption and galactic extinction;
- Column 12: a flag indicates whether the frame was taken under photometric (P) or cirrus (C) conditions;
- Column 13: Hα+[NII] morphology of the galaxy: N: nucleated, S: spiral shape, D: diffuse, H: dominated by asymmetric, giant HII regions;
- Column 14: notes to the present observations;
- Column 15 and 16: Hα + [NII]EW and F(Hα + [NII]) flux from the literature;
- Column 17: references to the Hα data available in the literature;
- Column 18: an asterisk indicates a note at the end of the table.

The red continuum images of the detected galaxies with structure in their Hα emission are shown as contours plots superposed to the Hα+[NII] net image (grey levels) in Fig. 1.

The Hα+[NII] morphology is generally very different from the red continuum one. In only a few objects the spiral morphology can be seen in the Hα+[NII] image (see

Col. 13 of Table 5), as in VCC 307, while in other galaxies the dominant star forming regions are located in the nucleus (see for example VCC 801) or in giant HII regions distributed non-uniformly throughout the disc of the galaxy, as in VCC 664. In some other objects the emission is diffuse (VCC 497).

5.1. Recalibrations

16 galaxies previously observed with the Calar Alto 3.5 m telescope (Hippelein et al., in preparation) in non photometric conditions were reobserved at the OHP with 5 min exposures in the ON band filter in order to achieve a flux calibration. If $n_{\frac{\mathrm{ON_{CA}}}{\mathrm{ON_{OHP}}}}$ is the normalization constant between the ON band Calar Alto and OHP images (normalized to the same integration time), the ON band zero point for Calar Alto observations $Zp_{\mathrm{ON_{CA}}}$ is given by the relation:

$$Zp_{\mathrm{ON_{CA}}} = \frac{Zp_{\mathrm{ON_{OHP}}}}{n_{\frac{\mathrm{ON_{CA}}}{\mathrm{ON_{OHP}}}}} \quad (1)$$

where $Zp_{\mathrm{ON_{OHP}}}$ is the OHP zero point determined for the galaxy at a given airmass. $Zp_{\mathrm{ON_{CA}}}$ does not need to be corrected for airmass.

The resulting fluxes are given in Table 6.

5.2. Comparison with the literature

Fluxes and equivalent widths given in this paper are in general consistent with available measurements, as shown in Fig. 2. The average value of the difference between our measurements and those available in the literature is: $\mathrm{H}\alpha + [\mathrm{NII}]EW_{\mathrm{TW}} - \mathrm{H}\alpha + [\mathrm{NII}]EW_{\mathrm{L}} = 0 \pm 10$ Å and $-\log F(\mathrm{H}\alpha + [\mathrm{NII}])_{\mathrm{TW}} + \log F(\mathrm{H}\alpha + [\mathrm{NII}])_{\mathrm{L}} = -0.04 \pm 0.32$ erg cm^{-2} s^{-1} [3] (in the comparison of the $\mathrm{H}\alpha + [\mathrm{NII}]EW$ we excluded those long slit spectra of Gavazzi et al. not including the entire galaxy). The outlying galaxy in the flux-flux relation is VCC 1003. Spectroscopic observations (GS) give an $\mathrm{H}\alpha + [\mathrm{NII}]EW$ smaller than that obtained in this work; the flux given in Table 5 could thus be overestimated. The outlying galaxies in the equivalent width relation, whose $\alpha + [\mathrm{NII}]EW$ are significantly higher in this work with respect to the literature, are VCC 798 (open dot), VCC 857 (filled square) and VCC 1003 (filled exagon). As explained in the notes of Table 5, the value given for VCC 798 is highly uncertain. The Hα image of VCC 857 shows emission in small, low surface brightness HII regions. We thus trust our value.

[3] 17 out of the 24 objects in commun with Koopmann et al. (2001) have Hα data already published in Young et al. (1996) and are thus non-independent measurements. In the comparison between our data and those in the literature we did not use the reference Young et al. (1996) for galaxies in common with Koopmann et al. (2001).

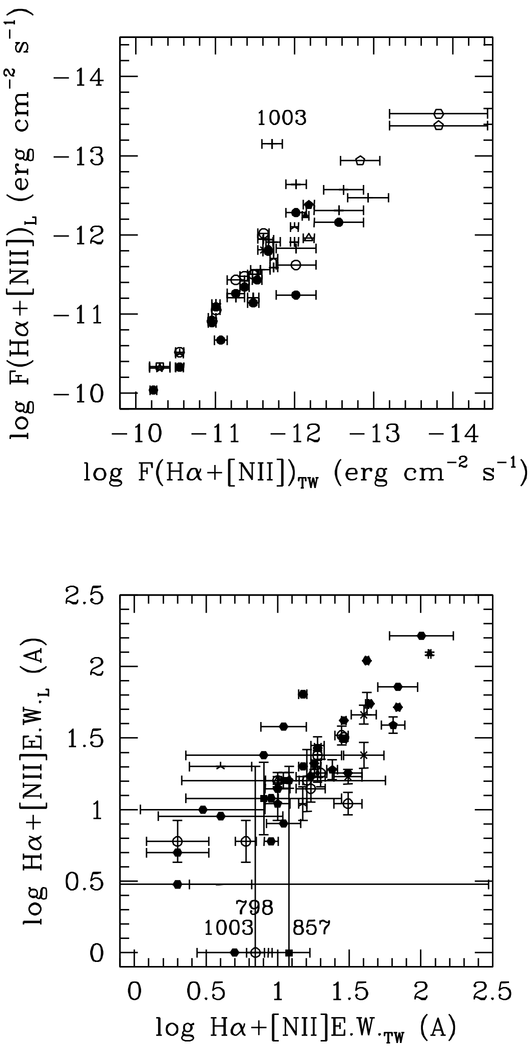

Fig. 2. Comparison with data in the literature: open dots are for KK, filled dots for Y, filled squares for H, x for R, + for Ko, ⅄ for K, open triangles for B, open squares for D, stars for Gr, filled triangles for G, filled pentagons for Kpc, open pentagons for GH, open exagons for K92 and filled exagons for GS.

6. Summary and conclusion

We present Hα+[NII] imaging data (fluxes and equivalent widths) of 122 galaxies obtained at the 1.20 m telescopes of the Observatoire de Haute Provence (OHP) and of Calar Alto. The present observations of late-type galaxies in the Virgo cluster are aimed at completing a large project of multifrequency observations of galaxies spanning a large range in morphological type and luminosity and belonging to different environments (cluster-isolated) aimed at constructing a data-set suitable for statistical studies.

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Table 5. The results of the observations.

Virgo

									This work					Literature			
VCC	ON	OFF	Tel	Year	T	R(Ha)	$n_{\frac{ON}{OFF}}$	K	Hα + [NII]EW	F(Hα + [NII])	Phot	Morph	Notes	Hα + [NII]EW	F(Hα + [NII])	Ref.	Notes
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
67	6561	6450	OHP	2000	60	0.78	0.98	1.00	27 ± 3	−12.69 ± 0.05	P	H		-	-	-	
92	6561	6450	OHP	1998	30	0.79	1.00	1.00	9 ± 1	−11.53 ± 0.06	P	DS		-	−11.50	Ko	*
145	6561	6450	OHP	2000	45	0.68	1.02	1.00	7 ± 1	-	C	DS		-	−12.04	Y	
165	6561	6450	OHP	2000	30	0.77	1.02	1.00	0 ± 2	-	C			-	-	-	
167	6561	6450	OHP	2000	30	0.78	1.02	1.00	3 ± 1	-	C	DS		-	−11.52	Y	
222	6612	6561	OHP	2000	45	0.67	1.11	1.00	2 ± 1	−12.75 ± 0.07	P	N		-	-	-	
234	6569	6744	CA	1999	30	0.80	1.10	0.64	13 ± 12	−12.31 ± 0.23	P	ND		-	-	-	
267	6569	6744	CA	1999	30	0.85	1.11	0.66	11 ± 18	−12.83 ± 0.45	P	S		16 ± 3		Hi	
307	6612	6561	OHP	1998	30	0.68	1.16	1.00	29 ± 1	−10.96 ± 0.05	P	S		32 ± 1	−10.91	KK	*
315	6612	6450	OHP	2000	45	0.65	1.08	1.00	0 ± 1	-	P			-	-	-	
341	6612	6450	OHP	2000	45	0.68	1.08	1.00	2 ± 1	−12.86 ± 0.16	P	ND		-	-	-	
371	6569	6744	CA	1999	30	0.75	1.16	0.63	2 ± 2	-	P			-	-	-	
375	6569	6744	CA	1999	30	0.70	1.18	0.61	−1 ± 4	-	P			-	-	-	
382	6569	6744	CA	1999	30	0.75	1.21	0.63	30 ± 4	−11.78 ± 0.05	P	HN		-	-	-	
386	6569	6744	CA	1999	30	0.70	1.19	0.61	−1 ± 11	-	P			-	-	-	
408	6569	6744	CA	1999	30	0.67	1.15	0.67	4 ± 3	−12.41 ± 0.20	P	D		-	-	-	
483	6569	6744	CA	1999	30	0.82	1.16	0.64	31 ± 7	−11.61 ± 0.07	P	S		17 ± 2	−11.81	R	*
497	6569	6744	CA	1999	30	0.82	1.16	0.64	15 ± 8	−11.86 ± 0.14	P	D		-	-	-	
524	6612	6450	OHP	2000	30	0.42	1.14	1.00	5 ± 1	−12.52 ± 0.09	P	D		-	-	-	
559	6561	6450	OHP	2000	45	0.78	1.03	1.00	2 ± 1	−12.86 ± 0.15	P	N		-	-	-	
570	6569	6744	CA	1999	30	0.82	1.43	0.64	−1 ± 11	-	C			-	-	-	
596	6612	6561	OHP	1998	30	0.64	1.18	1.00	18 ± 1	−11.01 ± 0.05	P	S		18 ± 1	−11.05	KK	*
608	6612	6561	OHP	1998	30	0.66	1.18	1.00	−1 ± 1	-	P			-	-	-	
630	6612	6561	OHP	2000	45	0.64	1.10	1.00	7 ± 2	−12.62 ± 0.12	P	SD		-	-	-	
634	6561	6612	OHP	1998	30	0.76	0.85	1.00	2 ± 2	-	P			-	-	-	
656	6612	6450	OHP	2000	45	0.43	1.13	1.00	9 ± 1	-	P	NDS		6	-	GS	
657	6612	6450	OHP	2000	45	0.27	1.13	1.00	−1 ± 1	-	P			-	-	-	
664	6569	6744	CA	1999	30	0.82	1.17	0.64	101 ± 52	−12.12 ± 0.11	P	H		164	-	GS	
672	6612	6450	OHP	2000	45	0.41	1.10	1.00	−1 ± 1	-	P			-	-	-	
697	6612	6450	OHP	2000	45	0.50	1.10	1.00	15 ± 8	−12.81 ± 0.21	P	S		-	-	-	
792	6612	6450	OHP	2000	30	0.43	1.11	1.00	10 ± 2	−12.02 ± 0.13	P	DS		-	−12.64	Ko	*
794	6612	6450	OHP	2000	45	0.40	1.11	1.00	−1 ± 2	-	P			-	-	-	
797	6612	6450	OHP	2000	30	0.28	1.06	1.00	−1 ± 13:	-	C		*	-	-	-	
798	6612	6450	OHP	2000	30	0.28	1.06	1.00	7 ± 1:	−11.87 ± 0.12:	N	ND	*	-	-	-	
801	6612	6450	OHP	2000	45	0.66	1.11	1.00	69 ± 2	−11.57 ± 0.12	P	N		-	−11.56	Ko	*
836	6612	6561	OHP	2000	60	0.67	1.17	1.00	15 ± 1	−11.67 ± 0.13	P	NS		64	-	GS	
857	6612	6450	OHP	2000	30	0.40	1.06	1.00	12 ± 4	-	C	S		-	−12.25	Ko	*
865	6561	6450	OHP	2000	40	0.78	1.04	1.00	34 ± 2	−12.12 ± 0.05	P	SH	*	-	-	-	
873	6569	6744	CA	1999	20	0.85	1.19	0.65	10 ± 2	−12.18 ± 0.07	P	S		16 ± 1	−11.97	B	*
874	6569	6744	CA	1999	30	0.82	1.18	0.65	3 ± 3	−12.93 ± 0.26	P	S		-	−12.47	Ko	*
905	6612	6450	OHP	2000	45	0.52	1.29	1.00	39 ± 16:	−12.64 ± 0.14:	N	S	*	-	-	-	
912	6569	6744	CA	1999	30	0.84	1.21	0.65	8 ± 10:	−12.56 ± 0.31:	Y	NS	*	-	−12.31	Ko	*
916	6569	6744	CA	1999	30	0.82	1.20	0.64	−1 ± 7	-	P			-	-	-	
939	6612	6450	OHP	2000	45	0.51	1.29	1.00	40 ± 13:	-	C	S		24 ± 5	−12.37	R	*
958	6561	6450	OHP	2000	45	0.78	0.94	1.00	7 ± 1	-	C	NS		-	−12.70	Ko	*
979	6561	6450	OHP	2000	45	0.76	1.00	1.00	9 ± 1	-	C	N		-	−12.22	Ko	*
984	6569	6744	CA	1999	30	0.82	1.17	0.65	1 ± 4	-	P		*	-	-	-	
1003	6612	6450	OHP	2000	45	0.48	1.06	1.00	5 ± 3	−11.72 ± 0.13	P	ND	*	-	−13.15	Ko	
1145	6569	6744	CA	1999	20	0.82	1.16	0.64	11 ± 3	−11.73 ± 0.09	P	H		-	−11.91	Ko	*
1182	6744	6569	CA	1999	30	0.82	0.86	1.00	42 ± 3	−13.08 ± 0.05	P	HS		-	-	-	
1190	6561	6450	OHP	2000	45	0.76	0.96	1.00	3 ± 1	−12.49 ± 0.08	P	ND		-	-	-	
1192	6569	6744	CA	1999	30	0.82	1.17	0.64	−1 ± 3	-	P			-	-	-	
1203	6569	6744	CA	1999	30	0.82	1.17	0.64	3 ± 8	-	P			-	-	-	
1205	6569	6744	CA	1999	30	0.75	1.17	0.63	11 ± 4	−12.50 ± 0.11	P	S		38	-	GS	
1375	6612	6561	OHP	2000	45	0.65	1.17	1.00	28 ± 3	-	C	S		33 ± 5	−11.69	KK	

Table 5. continued.

									This work					Literature			
VCC	ON	OFF	Tel	Year	T	R(Ha)	$n_{\frac{ON}{OFF}}$	K	Hα + [NII]EW	F(Hα + [NII])	Phot	Morph	Notes	Hα + [NII]EW	F(Hα + [NII])	Ref.	Notes
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1401	6612	6561	OHP	1998	20	0.68	1.17	1.00	6 ± 1	−11.48 ± 0.07	P	S		6 ± 2	−11.50	KK	*
1412	6569	6744	CA	1999	30	0.82	1.21	0.64	−1 ± 2	-	P			-	-	-	
1450	6569	6744	CA	1999	30	0.84	1.13	0.65	69 ± 22	−11.89 ± 0.08	P	H		72	-	GS	
1453	6569	6744	CA	1999	30	0.82	1.13	0.65	1 ± 15	-	P			-	-	-	
1540	6612	6561	OHP	2000	30	0.65	1.10	1.00	20 ± 1	-	C	S		-	−11.35	Ko	*
1552	6569	6744	CA	1999	30	0.85	1.20	0.65	2 ± 10	-	P			3	-	GS	
1555	6612	6561	OHP	1998	30	0.68	1.14	1.00	17 ± 4	−11.26 ± 0.11	P	S		14 ± 3	−11.43	KK	*
1562	6612	6561	OHP	1998	20	0.66	1.19	1.00	20 ± 2	−11.37 ± 0.06	P	SN		18 ± 4	−11.48	KK	*
1572	6612	6561	OHP	2000	30	0.66	1.10	1.00	−1 ± 2	-	C			-	-	-	
1575	6561	6450	OHP	1998	30	0.73	1.02	1.00	13 ± 1	−12.73 ± 0.06	P	H		54	-	GS	
1588	6569	6744	CA	1999	30	0.82	1.16	0.64	3 ± 3	−12.56 ± 0.32	P	S		-	-	-	
1673	6612	6561	OHP	1998	30	0.68	1.13	1.00	15 ± 1	−12.00 ± 0.05	P	S		11 ± 3	−12.10	K	*
1676	6612	6561	OHP	1998	30	0.68	1.13	1.00	19 ± 1	−11.74 ± 0.05	P	S		20 ± 5	−11.70	K	*
1690	6561	6612	OHP	1998	30	0.78	0.87	1.00	2 ± 1	−12.02 ± 0.25	P	S		6 ± 2	−11.62	KK	*
1730	6569	6744	CA	1999	30	0.82	1.20	0.64	4 ± 4	−12.62 ± 0.25	P	SD		-	−12.57	Ko	*
1760	6612	6450	OHP	2000	40	0.38	1.11	1.00	5 ± 2	−12.46 ± 0.16	P	NDS		-	-	-	
1859	6569	6744	CA	1999	30	0.82	1.24	0.64	−1 ± 12	-	P			-	−12.67	Ko	
1868	6569	6744	CA	1999	30	0.80	1.24	0.65	3 ± 9	-	P			-	-	-	
1931	6612	6450	OHP	2000	30	0.47	1.10	1.00	36 ± 20	−13.33 ± 0.32	P	N		-	-	-	
1941	6612	6450	OHP	2000	30	0.50	1.10	1.00	−1 ± 4	-	P			-	-	-	
1943	6612	6450	OHP	2000	30	0.44	1.10	1.00	24 ± 2	−11.67 ± 0.07	P	S		19	−11.82	Kpc	*
14063	6612	6450	OHP	2000	30	0.48	1.07	1.00	32 ± 2	−11.24 ± 0.10	P	S		-	-	-	
71060	6612	6561	OHP	2000	30	0.66	1.12	1.00	44 ± 1	−11.97 ± 0.04	P	NHS		55	-	GS	
Coma/A1367 supercluster																	
									This work					Literature			
CGCG	ON	OFF	Tel	Year	T	R(Ha)	$n_{\frac{ON}{OFF}}$	K	Hα + [NII]EW	F(Hα + [NII])	Phot	Morph	Notes	Hα + [NII]EW	F(Hα + [NII])	Ref.	Notes
160065	6744	6569	CA	1999	10	0.83	0.87	1.00	−1 ± 2	-	P		*	-	-	-	
160069	6744	6569	CA	1999	20	0.82	0.87	1.00	−1 ± 2	-	P		*	-	-	-	
160213	6744	6569	CA	1999	20	0.68	0.87	1.00	57 ± 3	−12.92 ± 0.05	P	H	*	-	-	-	
160214	6744	6569	CA	1999	20	0.84	0.87	1.00	−1 ± 1	-	P		*	-	-	-	
160215	6744	6569	CA	1999	20	0.84	0.87	1.00	−1 ± 2	-	P		*	-	-	-	
160216	6744	6569	CA	1999	10	0.84	0.87	1.00	−1 ± 2	-	P		*	-	-	-	
160221	6744	6569	CA	1999	10	0.82	0.87	1.00	−1 ± 3	-	P		*	-	-	-	
160222	6744	6569	CA	1999	10	0.05	0.87	1.00	−1 ± 22	-	P		*	-	-	-	
161043	6744	6569	CA	1999	30	0.77	0.84	1.00	−1 ± 1	-	P			-	-	-	
161069	6744	6569	CA	1999	30	0.82	0.84	1.00	24 ± 1	−12.66 ± 0.05	P	H		-	-	-	
A2197/A2199																	
									This work					Literature			
CGCG	ON	OFF	Tel	Year	T	R(Ha)	$n_{\frac{ON}{OFF}}$	K	Hα + [NII]EW	F(Hα + [NII])	Phot	Morph	Notes	Hα + [NII]EW	F(Hα + [NII])	Ref.	Notes
224008	6744	6569	CA	1999	30	0.75	0.81	1.00	14 ± 2	−12.95 ± 0.07	P	D		-	-	-	
224009	6744	6569	CA	1999	30	0.70	0.81	1.00	14 ± 2	−12.69 ± 0.07	P	S		-	-	-	
224037N	6744	6569	CA	1999	30	0.70	0.84	1.00	6 ± 2	−13.40 ± 0.12	P	N		-	-	-	
224037S	6744	6569	CA	1999	30	0.77	0.84	1.00	5 ± 1	−13.54 ± 0.08	P	N		-	-	-	
224038	6744	6569	CA	1999	30	0.82	0.84	1.00	115 ± 2	−12.14 ± 0.04	P	H		123 ± 3	−12.24	G	
224046	6744	6569	CA	1999	30	0.77	0.84	1.00	17 ± 2	−12.88 ± 0.07	P	NDS		-	-	-	

Table 5. continued.

Nearby galaxies

									This work					Literature			
Name	ON	OFF	Tel	Year	T	R(Ha)	$n_{\frac{ON}{OFF}}$	K	Hα + [NII]EW	F(Hα + [NII])	Phot	Morph	Notes	Hα + [NII]EW	F(Hα + [NII])	Ref.	Notes
M51	6561	6450	OHP	2000	15	0.77	1.02	1.00	18.6 ± 1.6	−10.55 ± 0.05	P	S	*	24 ± 2	−10.52:	KK	*
M81	6561	6450	OHP	2000	10	0.78	0.96	1.00	9.7 ± 2.9	−10.30 ± 0.13	P	SN	M	-	−10.34	D	*
M82	6561	6450	OHP	1998	15	0.77	0.93	1.00	42.3 ± 0.5	−10.22 ± 0.04	P	N		-	−10.04	Y	*
M106	6561	6450	OHP	2000	15	0.76	0.95	1.00	12.3 ± 2.0	-	C	S	M	11	−10.66	Kpc	*
N925	6561	6450	OHP	2000	30	0.74	0.98	1.00	23.3 ± 4.1	-	C	S		-	−11.10	Y	
N1637	6561	6450	OHP	2000	60	0.68	1.09	1.00	9.9 ± 1.7	-	C	S		16 ± 2	−11.68	KK	
N2403	6561	6450	OHP	2000	10	0.77	0.92	1.00	64.4 ± 11.8	-	C	S	M	26	−10.34	Kpc	
N2541	6561	6450	OHP	2000	40	0.75	0.92	1.00	39.6 ± 8.0	-	C	S		46 ± 7	−11.64	R	
N2805	6612	6561	OHP	2000	60	0.65	1.07	1.00	52.3 ± 11.2	-	C	S		-	-	-	
N2903	6561	6450	OHP	2000	30	0.76	1.00	1.00	15.0 ± 1.3	−11.07 ± 0.08	P	S	*	-	−10.67	Y	*
N5195	6561	6450	OHP	2000	15	0.77	1.10	1.00	3.5 ± 2.3	−12.18 ± 0.99	C	N	*	20:	-	K	*

Notes:
M in notes indicates a mosaic of several frames; if not specified, the given data are alternative values in the literature with reference.
VCC 92: F(Hα + [NII]) = −11.43 erg cm^{-2} s^{-1} (Y); Hα + [NII]EW = 12 Å (GS).
VCC 307: Hα + [NII]EW = 31 ± 1 Å (H), Hα + [NII]EW = 42 ± 1 Å (GS), F(Hα + [NII]) = −10.89 erg cm^{-2} s^{-1} (Y), F(Hα + [NII]) = −10.95 erg cm^{-2} s^{-1} (Ko).
VCC 483: Hα + [NII]EW = 11 ± 2 Å, Hα + [NII]EW = 18 ± 1 Å (GS), F(Hα + [NII]) = −12.02 erg cm^{-2} s^{-1} (KK), F(Hα + [NII]) = −11.95 erg cm^{-2} s^{-1} (Ko), F(Hα + [NII]) = −11.74 erg cm^{-2} s^{-1} (Y).
VCC 596: Hα + [NII]EW = 21 ± 1 Å (GS), F(Hα + [NII]) = −11.13 erg cm^{-2} s^{-1} (Ko), F(Hα + [NII]) = −11.09 erg cm^{-2} s^{-1} (Y).
VCC 792: F(Hα + [NII]) = −12.28 erg cm^{-2} s^{-1} (Y).
VCC 797: at the border of the filter.
VCC 798: at the border of the filter; observed in non photometric conditions; flux calibrated on VCC 857 from Y.
VCC 801: Hα + [NII]EW = 52 ± 3 Å (GS).
VCC 857: Hα + [NII]EW = −1 ± 3 Å (KK), Hα + [NII]EW = 1 ± 3 Å (H), F(Hα + [NII]) = −11.97 erg cm^{-2} s^{-1} (Y).
VCC 865: 2 coherent measurements.
VCC 873: Hα + [NII]EW = 11 Å(Kpc), Hα + [NII]EW = 14 Å(GS), F(Hα + [NII]) = −12.38 erg cm^{-2} s^{-1} (Kpc).
VCC 874: Hα + [NII]EW = 10 ± 3 Å (GS).
VCC 905: observed in non photometric conditions; flux calibrated on VCC 939 from R.
VCC 912: vignetted; poor quality; Hα + [NII]EW = 12 ± 7 Å (H), Hα + [NII]EW = 24 ± 7 Å (GS), and F(Hα + [NII]) = −12.16 erg cm^{-2} s^{-1} (Y).
VCC 939: F(Hα + [NII]) = −12.28 erg cm^{-2} s^{-1} (Ko)
VCC 958: F(Hα + [NII]) = −11.81 erg cm^{-2} s^{-1} (Y)
VCC 979: F(Hα + [NII]) = −12.10 erg cm^{-2} s^{-1} (Y)
VCC 984: vignetted.
VCC 1003: Hα + [NII]EW = 1 ± 3 Å (GS).
VCC 1145: Hα + [NII]EW = 8 ± 3 Å (GS).
VCC 1401: F(Hα + [NII]) = −11.21 erg cm^{-2} s^{-1} (Ko), F(Hα + [NII]) = −11.14 erg cm^{-2} s^{-1} (Y).
VCC 1540: F(Hα + [NII]) = −11.28 erg cm^{-2} s^{-1} (Y).
VCC 1555: Hα + [NII]EW = 3 ± 3 Å (GS), F(Hα + [NII]) = −11.21 erg cm^{-2} s^{-1} (Ko), F(Hα + [NII]) = −11.26 erg cm^{-2} s^{-1} (Y).
VCC 1562: F(Hα + [NII]) = −11.42 erg cm^{-2} s^{-1} (Ko), F(Hα + [NII]) = −11.34 erg cm^{-2} s^{-1} (Y).
VCC 1673: F(Hα + [NII]) in reference does not include the whole galaxy. Other references give: Hα + [NII]EW = 20 ± 3 Å (GS), F(Hα + [NII]) = −11.91 erg cm^{-2} s^{-1} (Ko).
VCC 1676: F(Hα + [NII]) in reference does not include the whole galaxy. Other references give: Hα + [NII]EW = 27 ± 3 Å (GS), F(Hα + [NII]) = −11.59 erg cm^{-2} s^{-1} (Ko).
VCC 1690: Hα + [NII]EW = 5 ± 3 Å (GS), F(Hα + [NII]) = −11.83 erg cm^{-2} s^{-1} (Ko), F(Hα + [NII]) = −11.24 erg cm^{-2} s^{-1} (Y).
VCC 1730: Hα + [NII]EW = 9 ± 3 Å (GS).
VCC 1943: F(Hα + [NII]) = −11.94 erg cm^{-2} s^{-1} (Ko), F(Hα + [NII]) = −11.79 erg cm^{-2} s^{-1} (Y).
160065, 160069, 160213, 160214, 160215, 160216, 160221, 160222: affected by stray light from bright star.
M51: another image taken in non photometric conditions gives Hα + [NII]EW = 18 ± 5.4 Å; other references give: Hα + [NII]EW = 28 ± 4 Å, F(Hα + [NII]) = −10.5 erg cm^{-2} s^{-1} (not including the entire galaxy) (K); F(Hα + [NII]) = −10.33 erg cm^{-2} s^{-1} (Y).
M81: F(Hα + [NII]) = −10.32 erg cm^{-2} s^{-1} (Gr); HαEW = 6 Å, $F(H\alpha)$ = −10.49 erg cm^{-2} s^{-1} (Kpc; no [NII] included).
M82: Hα + [NII]EW = 45 Å (K92), Hα + [NII]EW = 110 Å (GS).
M106: [NII] not included in the reference values.
N2903: another image taken in non photometric conditions gives Hα + [NII]EW = 12 ± 3 Å; alternative value in the literature: Hα + [NII]EW = 28 Å in K92.
N5195: another image taken in non photometric conditions gives Hα + [NII]EW = 2 ± 1 Å; alternative value in the literature: Hα + [NII]EW = 3.5 Å in K92.
References: KK: Kennicutt & Kent (1983); K: Kennicutt et al. (1987); Y: Young et al. (1996); Hi: Hippelein et al., in preparation; R: Romanishin (1987); B: Boselli et al. (2002), Paper III; G: Gavazzi et al. (1998); D: Devereux et al. (1995); Gr: Greenawalt et al. (1998); K92: Kennicutt (1992) (spectroscopic survey drifting the telescope over the entire disc of the galaxy); Kpc: Kennicutt, private communication; Ko: Koopmann et al. (2001); GS: Gavazzi et al., in preparation (spectroscopic survey drifting the telescope over the entire disc of the galaxy).

Table 6. Calibration of the Calar Alto 1993 observations.

VCC	Tel	$H\alpha+[NII]EW$	$F(H\alpha+[NII])$	$F(H\alpha+[NII])_L$	Ref.
87	OHP	20 ± 1	-12.83 ± 0.25:	-12.94	GH
152	OHP	9 ± 1	-12.63 ± 0.26	-	
159	OHP	19 ± 1	-13.21 ± 0.32	-	
446	OHP	18 ± 1	-13.47 ± 0.15	-	
641	OHP	20 ± 1	-13.55 ± 0.08:	-	
995	OHP	32 ± 1	-12.98 ± 0.13	-	
1002	OHP	9 ± 1	-12.10 ± 1.00:	-	
1189	OHP	21 ± 1	-12.66 ± 0.19	-	
1419	OHP	5 ± 2	-13.06 ± 0.79	-	
1486	OHP	12 ± 1	-13.17 ± 1.00:	-	
1507	OHP	11 ± 1	-13.51 ± 0.24	-	
1569	OHP	14 ± 2	-13.45 ± 0.31	-	
1678	OHP	55 ± 8	-12.56 ± 1.00:	-	
1929	OHP	13 ± 2	-12.75 ± 0.45	-	
1932	OHP	16 ± 1	-12.32 ± 0.49	-	
2037	OHP	16 ± 1	-13.82 ± 0.62	-13.53	B
2066	OHP	6 ± 1	-12.47 ± 1.00:	-	

Notes: 2037: also observed by GH ($F(H\alpha+[NII]) = -13.47$ erg cm^{-2} s^{-1}).
References: B: Boselli et al. (2002), Paper III; GH: Gallagher & Hunter (1989).

References

Binggeli, B., Sandage, A., & Tammann, G. 1985, AJ, 90, 1681 (VCC)

Binggeli, B., Popescu, C., & Tammann, G. 1993, A&AS, 98, 275

Boissier, S., Boselli, A., Prantzos, N., & Gavazzi, G. 2001, MNRAS, 321, 733

Boselli, A., Gavazzi, G., Donas, J., & Scodeggio, M. 2001, AJ, 121, 753

Boselli, A., Iglesias-Páramo, J., Vilchez, J. M., & Gavazzi, G. 2002, A&A, 386, 134 (Paper III)

Devereux, N., Jacoby, G., & Ciardullo, R. 1995, AJ, 110, 1115 (D)

Gallagher, J., & Hunter, D. 1989, AJ, 98, 806 (GH)

Gavazzi, G., & Boselli, A. 1996, Astro. Lett. and Commun., 35, 1

Gavazzi, G., Catinella, B., Carrasco, L., Boselli, A., & Contursi, A. 1998, AJ, 115, 1745 (G)

Gavazzi, G., Boselli, A., Scodeggio, M., Pierini, D., & Belsole, E. 1999a, MNRAS, 304, 595

Gavazzi, G., Carrasco, L., & Galli, R. 1999b, A&AS, 136, 227

Gavazzi, G., Franzetti, P., Scodeggio, M., Boselli, A., & Pierini, D. 2000, A&A, 361, 863

Gavazzi, G., Boselli, A., Pedotti, P., Gallazzi, A., & Carrasco, L. 2002, A&A, 386, 114 (Paper I)

Greenawalt, B., Walterbos, R., Thilker, D., & Hoopes, C. 1998, ApJ, 506, 135 (Gr)

Kennicutt, R. 1992, ApJ, 388, 310 (K92)

Kennicutt, R., & Kent, S. 1983, AJ, 88, 1094 (KK)

Kennicutt, R., Roettiger, K., Keel, W., van der Hulst, J., & Hummel, E. 1987, AJ, 93, 1011 (K)

Koopmann, R., Kenney, J., & Young, J. 2001, ApJS, 135, 125

Massey, P., Strobel, K., Barnes, J., & Anderson, E. 1988, ApJ, 328, 315

Nilson, P. 1973, Uppsala General Catalogue of Galaxies, Uppsala Obs. Ann., vol. 6, (UGC)

Romanishin, W. 1990, AJ, 100, 373 (R)

Young, J., Allen, L., Kenney, J., Lesser, A., & Brooks, R. 1996, AJ, 112, 1903 (Y)

Zwicky, F., Herzog, E., Karpowicz, M., Kowal, C., & Wild, P. 1961–1968, Catalogue of Galaxies and of Cluster of Galaxies (Pasadena, California Institute of Technology; CGCG)