

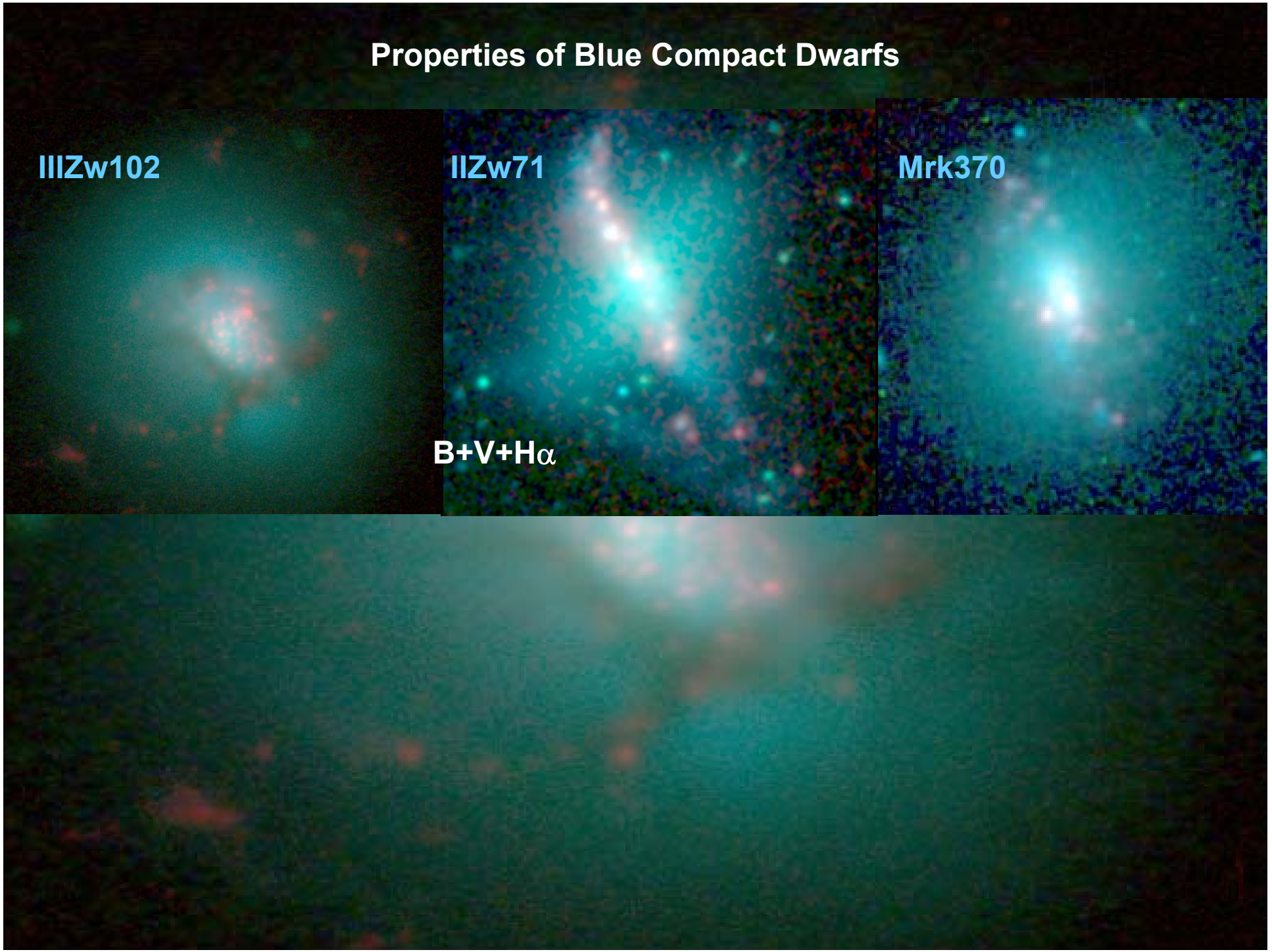
Starburts knots in Blue Compact Dwarf Galaxies

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Properties of Blue Compact Dwarfs



Properties of Blue Compact Dwarfs

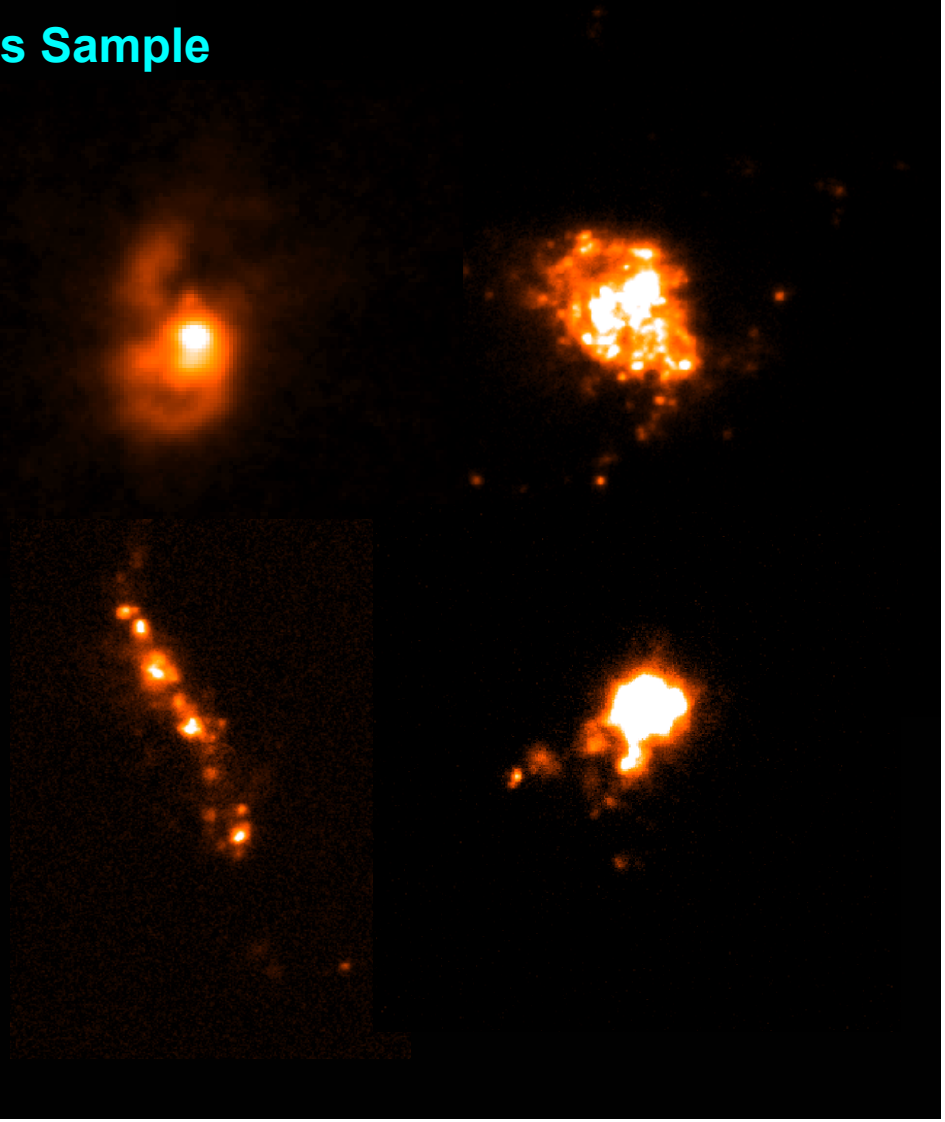
- Low Luminosity ($M_B > -18$)
- Compactness Starburst (D < 1 Kpc)
- Spectra Similar to HII regions in Sp
- Large OB Stellar Population
- UV continuum excess B-A-F stars
- Low Metallicity $1/50 \leq Z / Z_{\odot} \leq 1/3$
- High Star Formation Rate $0.1 \leq SFR \leq 1\ M_{\odot} \cdot yr^{-1}$
- HI Mass ~ 10^8 – 10^9 M⊙
- Gas comsuption time scales of ~ 1 Gyr
- 70% of BCDs are isolated
- Evidence of age ≥ 1 Gyr Underlying Stellar Population (Papaderos 1996a;Cairós 2001a; Östlin et al 2000)
- Classification : nE, iE, iI and i0 (Loose & Thuan 1981)

BACKGROUND

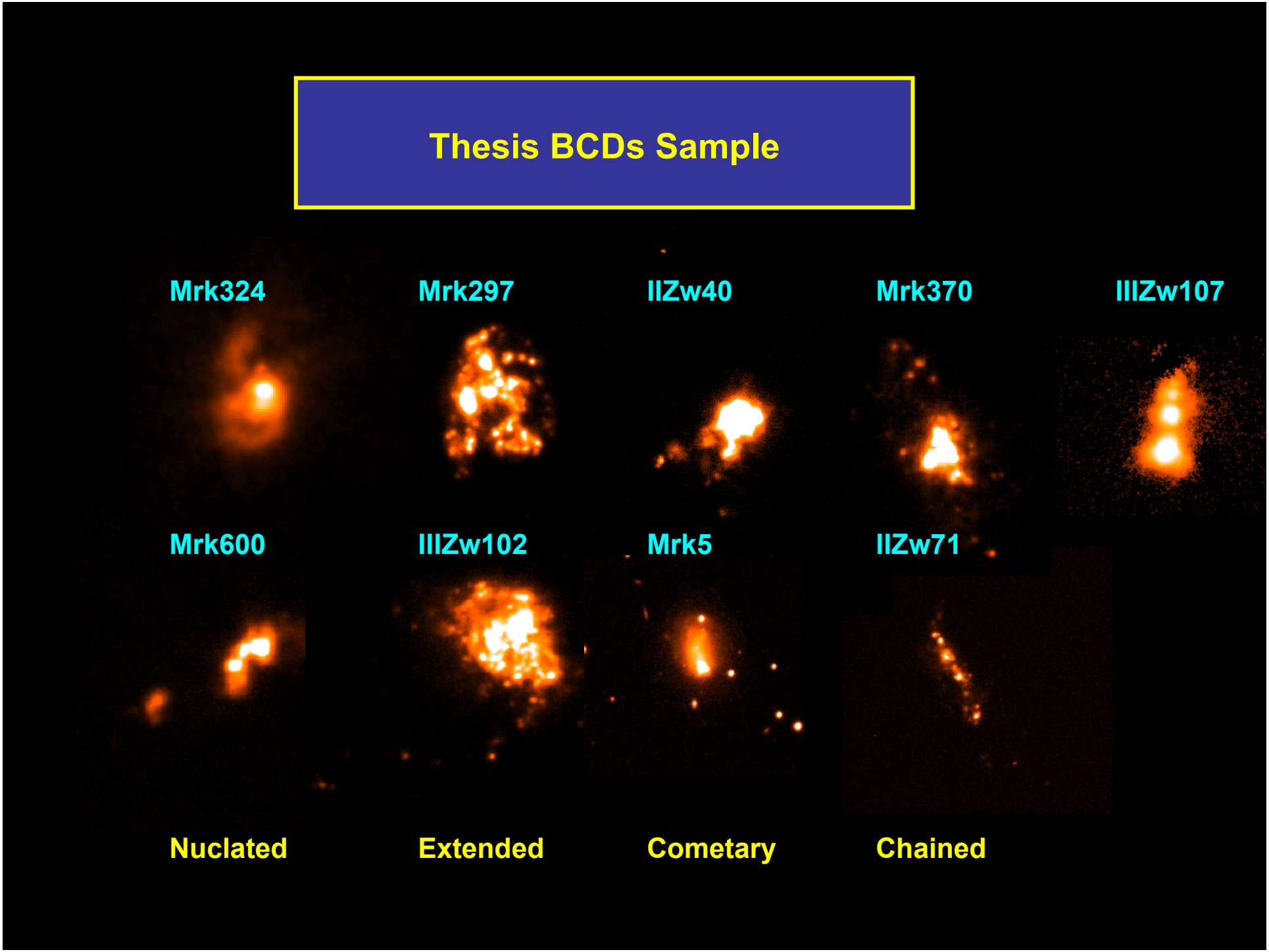
Cairós BCDs Sample

Morphology Classification

I. Nucleated Starburst
II. Extended Starburst
III. Chain Starburst
IV. Cometary Starburst



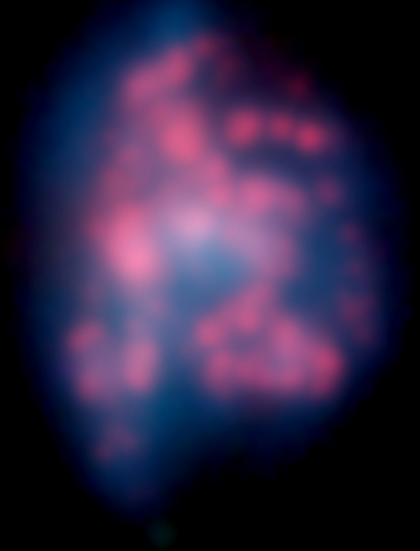
Thesis BCDs Sample




Are BCDs Able to Generate
Galactic Winds?

Super Galactic Winds

- Super nova-driven mass outflows is a vital ingredient in theories of the structure and evolution of the galaxies



- A solution to the lack on the metal abundances?
- Wich is its impact in the Interestellar Medium?
- Many works have reported studies of large ionized structures(filaments, shells, etc.) in low mass-star-forming-galaxies as Meurer 1992, Hunter 1993, Marlowe 1995

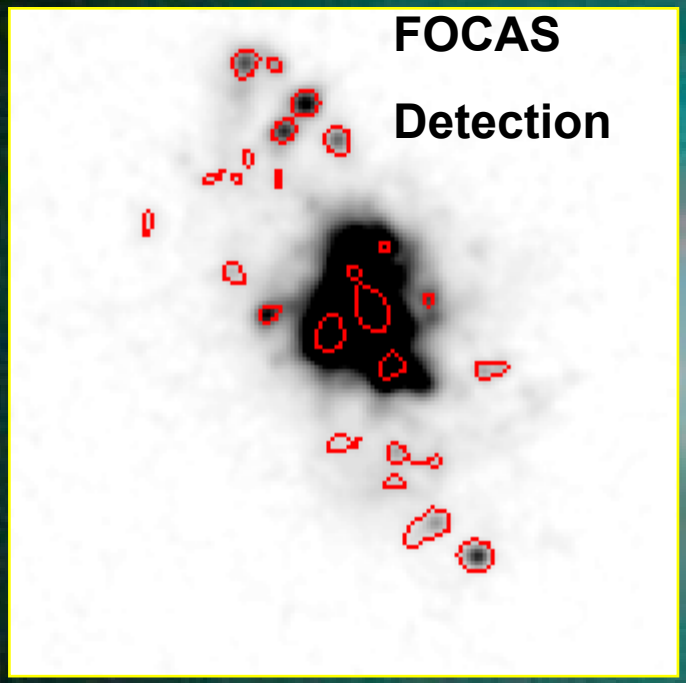
Goals

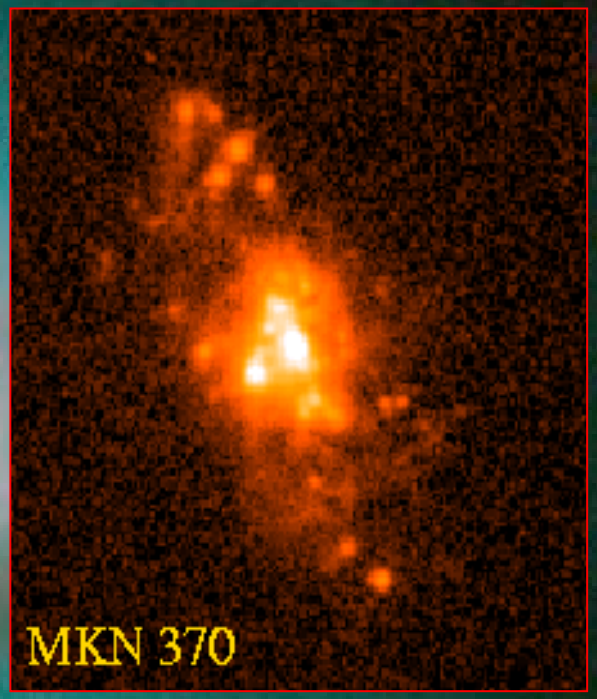
- Classify the burst of the galaxies (Catalogues)
- Star Formation History study for each galaxy

  Continuous SF or SSP?
- Triggering mechanisms
- Global analysis taking into account the classification.
- Conclusions for the different BCDs classes?
- Underlaying Stellar galaxy modelling (R. Amorín)

Hα Mrk370 Catalogue

Hα CCD imaging, NOT 2.6 m, ALFOSC, D = 10.85 Mpc

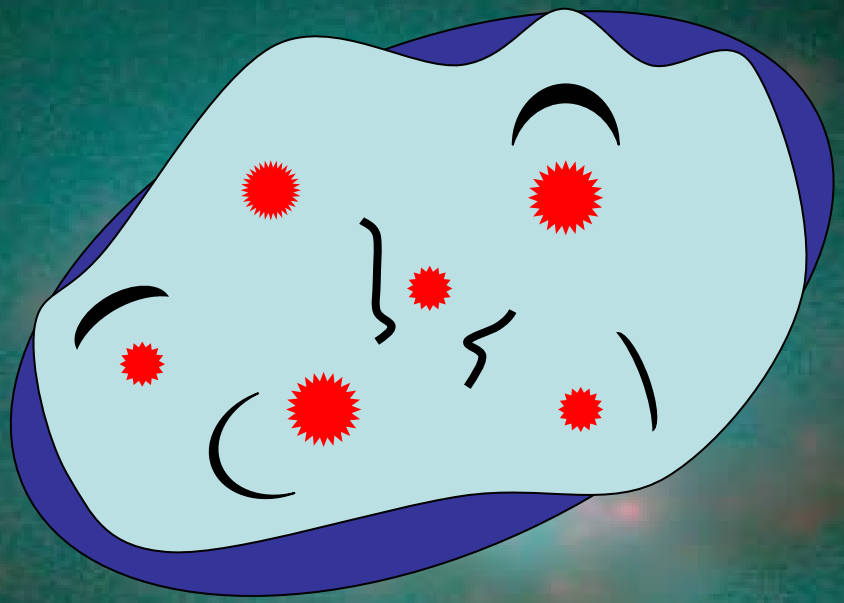




Parameters Obtained:

- ✓ **Size, Flux, Luminosity, SFR, Surface Brightness**

Has the diffuse emision some kind of structure?



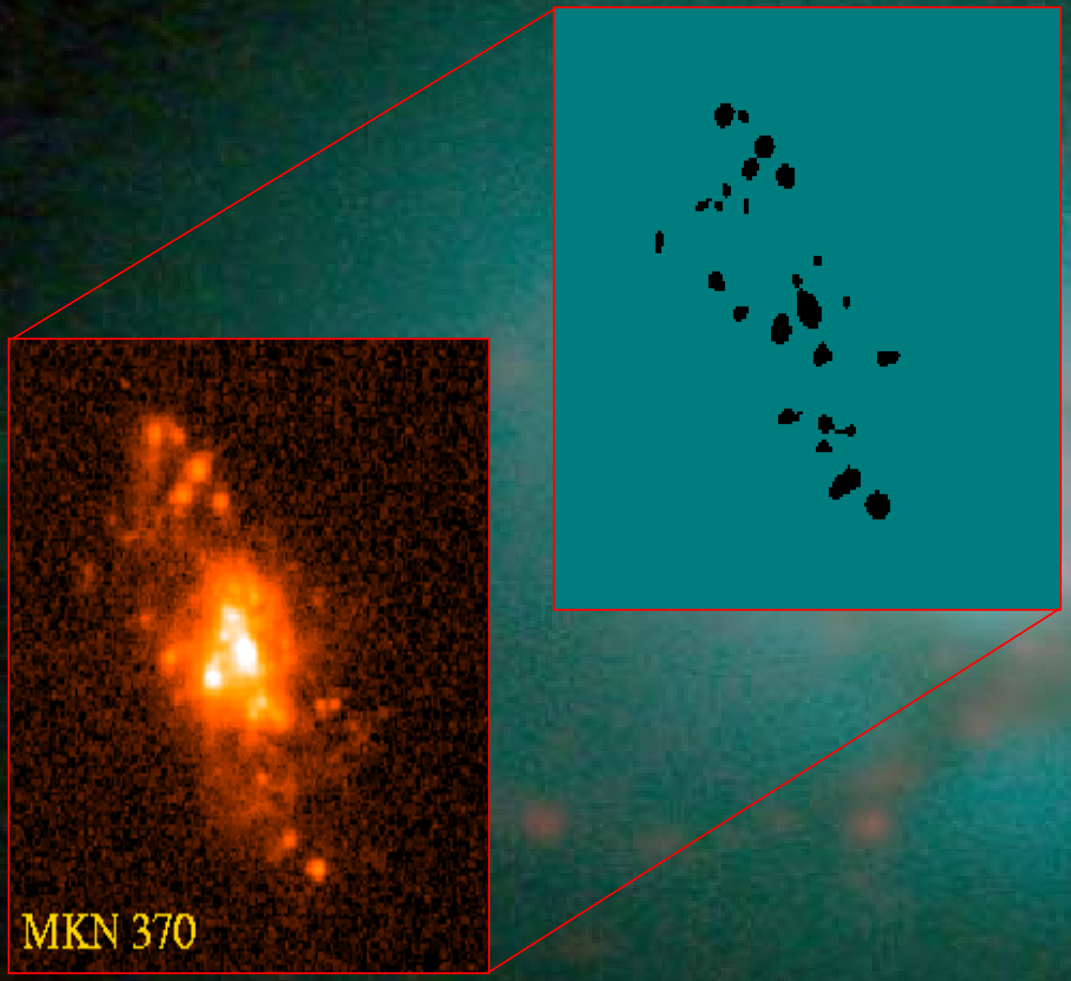
We want to map the diffuse emision

Are the diffuse emision linked to the starburt knots?

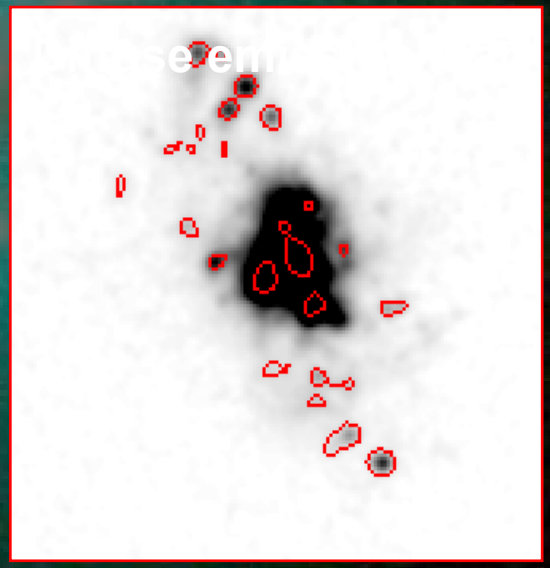
Example:

VIIZw403 (Silich, Tenorio-Tagle, Muñoz-Tuñón et al., 2002)

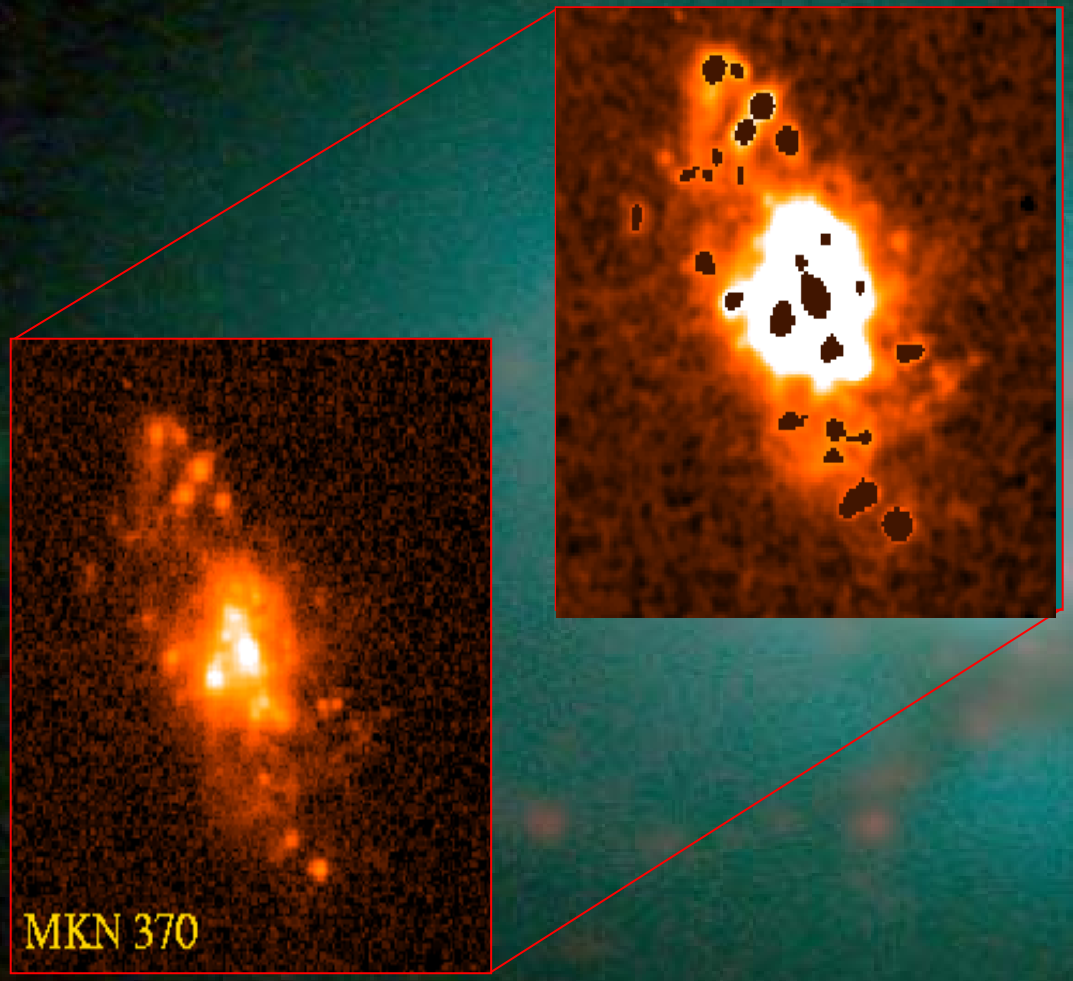
Diffuse Emission



- ✓Faint halfa emission
- ✓Descontaminate Halfa knots
- ✓Stablish % in Halfa emission
- ✓Is related to posible SGW processes?

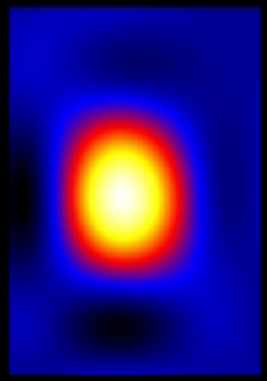


Diffuse Emission



- ✓Faint halfa emission
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- ✓Is related to posible SGW processes?

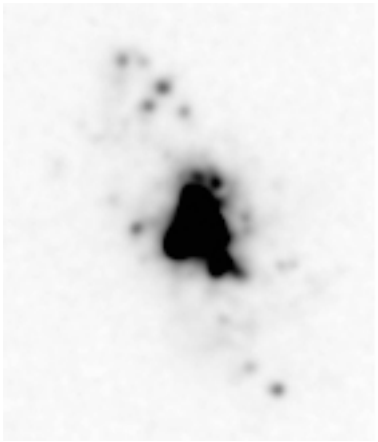
Diffuse emission map



Total Hα Image

Hα without Diffuse Emission

Mrk370

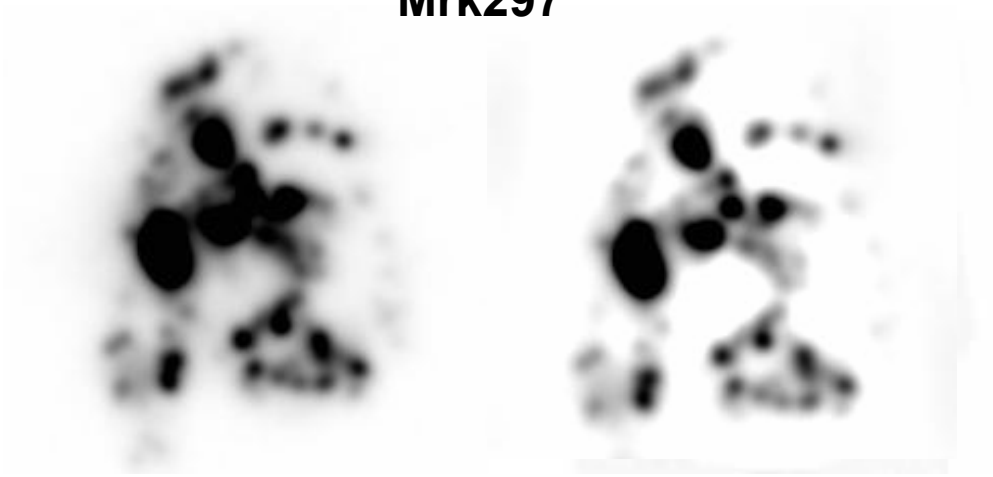




Total Hα Image

Hα without Diffuse Emission

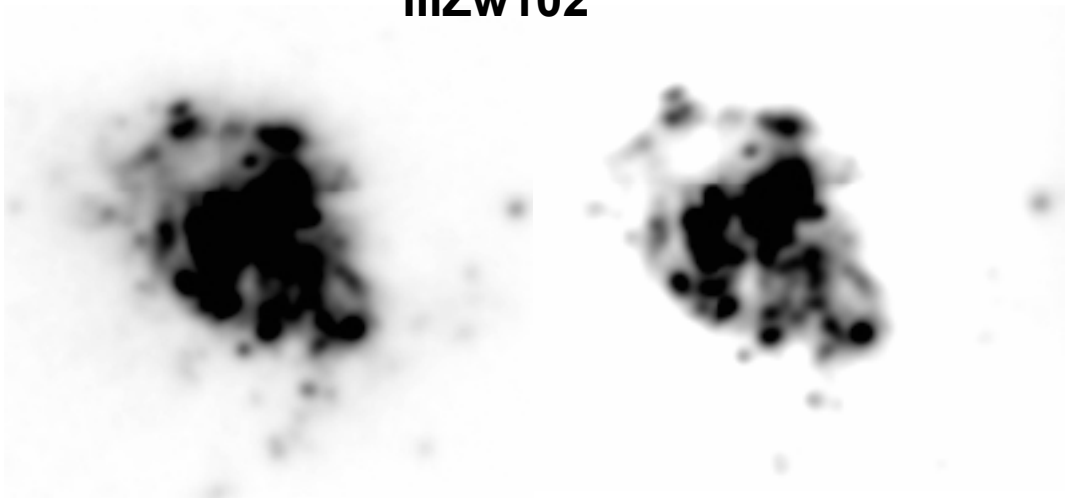
Mrk297



Total Hα Image

Hα without Diffuse Emission

IIIZw102



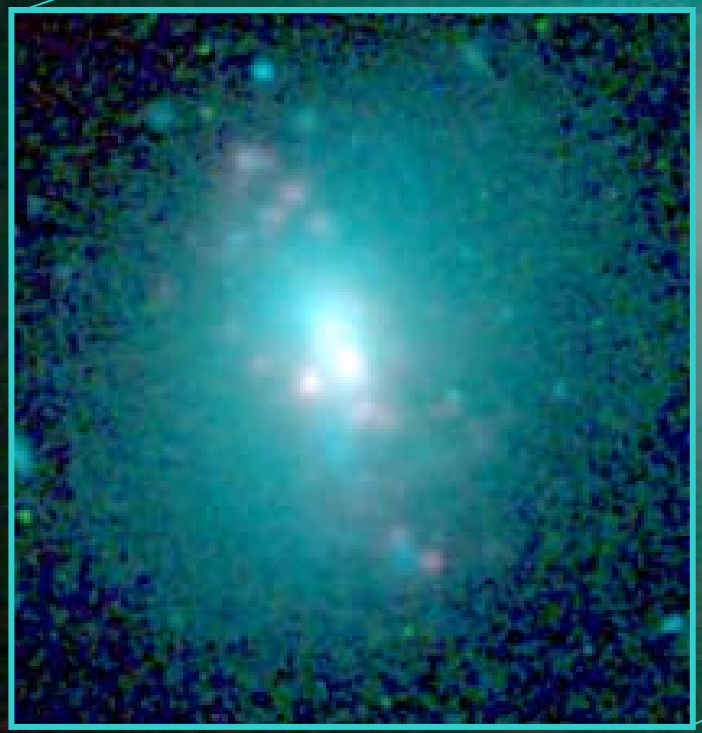
Catalogues

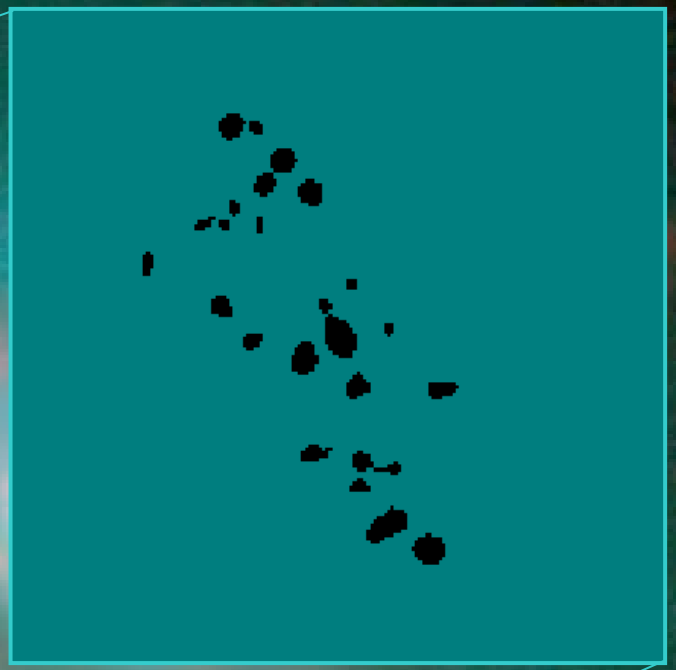
MRK370 *Hα* KNOTS CATALOGUE

ID	Δα(")	Δδ(")	R(")	R(pc)	F(*Hα*)	logL	SFR	SB	EW(Å)	S/N	F_{net}	F_{diff}
1	0.0	0.0	2.79	146.71	310.70	39.64	0.0389	34.81	198.88	561.00	276.29	34.42
2	-6.4	-3.7	2.34	122.85	123.89	39.24	0.0155	34.57	333.97	351.00	100.47	23.42
3	2.1	-7.4	1.82	95.68	28.31	38.60	0.0035	34.14	223.49	163.00	17.75	10.56
4	-3.2	5.3	1.08	56.71	26.66	38.57	0.0033	34.57	81.02	163.00	21.89	4.78
5	-9.5	27.6	1.98	104.34	6.18	37.94	0.0008	33.41	177.50	64.00	7.16	-0.98
6	13.2	-32.3	2.43	127.78	4.88	37.84	0.0006	33.13	200.73	49.00	4.96	-0.08
7	-17.5	32.9	1.98	104.34	4.24	37.78	0.0005	33.24	189.21	49.00	3.66	0.58
8	-14.3	-0.5	1.43	75.43	4.13	37.76	0.0005	33.51	96.81	54.00	1.05	3.08
9	1.1	8.5	0.90	47.19	4.10	37.76	0.0005	33.92	74.57	60.00	1.80	2.30
10	-12.2	23.8	1.77	93.05	3.95	37.75	0.0005	33.31	123.56	49.00	4.31	-0.36
11	7.9	-28.1	2.67	140.69	2.88	37.61	0.0004	32.81	75.76	30.00	4.93	-2.05
12	-5.3	22.8	2.01	105.51	2.70	37.58	0.0003	33.04	49.05	34.00	3.50	-0.80
13	6.9	1.6	0.95	49.74	1.63	37.36	0.0002	33.47	67.32	33.00	0.00	1.63
14	14.3	-7.9	1.77	93.05	1.52	37.33	0.0002	32.90	79.68	23.00	1.56	-0.03
15	-19.1	5.3	1.61	84.70	1.20	37.23	0.0002	32.88	36.07	20.00	1.50	-0.30
16	2.6	-18.5	1.55	81.73	1.17	37.22	0.0001	32.89	62.01	20.00	0.72	0.44
17	-13.2	32.9	1.12	58.85	1.03	37.16	0.0001	33.13	153.94	22.00	0.90	0.14
18	-5.3	-17.5	1.66	87.58	0.90	37.10	0.0001	32.72	28.84	15.00	0.00	0.90
19	2.1	-22.8	1.27	66.73	0.55	36.89	0.0001	32.75	66.07	12.00	1.33	-0.78
20	7.4	-20.1	1.16	60.92	0.47	36.82	0.0001	32.75	71.51	11.00	0.41	0.06
21	-30.2	12.2	1.23	64.85	0.38	36.73	0.0000	32.61	80.87	9.00	0.31	0.07
22	-22.3	17.5	1.12	58.85	0.32	36.65	0.0000	32.61	58.48	8.00	0.46	-0.14
23	-17.0	20.1	1.04	54.49	0.31	36.63	0.0000	32.66	39.20	8.00	0.24	0.07
24	-18.5	17.5	0.85	44.49	0.18	36.40	0.0000	32.60	36.32	6.00	0.17	0.01
25	-12.7	17.5	0.95	49.74	0.15	36.32	0.0000	32.43	26.05	4.00	0.00	0.15

U[F(Hα)]=10^{-15} erg·s^{-1}·cm^{-2} ; U[L(Hα)]=erg·s^{-1} ; U[SFR]=$M_{\odot}$·yr^{-1} ; U[SB]=erg·s^{-1}·Mpc^{-2}

Broad Band





USE THE MASKS ALREADY DEFINED FOR THE HALPHA KNOTS

Catalogues

MRK370 BROAD BAND KNOTS CATALOGUE

ID	m_U	m_B	m_V	m_R	m_I	U-B	B-V	V-R	R-I	B-R	V-I	Flux(U)	Flux(B)	Flux(V)	Flux(R)	Flux(I)
1	14.66	15.23	15.10	14.85	14.66	-0.58	0.13	0.25	0.19	0.38	0.44	3.99e-12	5.24e-12	2.96e-12	4.40e-12	2.72e-11
2	16.08	16.85	16.69	16.39	16.25	-0.77	0.16	0.30	0.14	0.46	0.44	1.07e-12	1.18e-12	6.82e-13	1.06e-12	6.32e-12
3	17.43	18.15	17.98	17.65	17.41	-0.71	0.16	0.34	0.23	0.50	0.57	3.09e-13	3.57e-13	2.08e-13	3.35e-13	2.16e-12
4	16.49	17.05	16.93	16.70	16.48	-0.56	0.11	0.23	0.22	0.35	0.45	7.38e-13	9.85e-13	5.47e-13	7.98e-13	5.11e-12
5	18.81	19.61	19.41	18.98	18.77	-0.79	0.20	0.43	0.22	0.63	0.64	8.65e-14	9.30e-14	5.57e-14	9.76e-14	6.22e-13
6	19.43	20.03	19.98	19.44	19.68	-0.60	0.05	0.54	-0.24	0.59	0.30	4.90e-14	6.29e-14	3.29e-14	6.40e-14	2.68e-13
7	19.04	19.85	19.72	19.48	19.20	-0.81	0.14	0.23	0.28	0.37	0.52	7.01e-14	7.41e-14	4.20e-14	6.16e-14	4.16e-13
8	19.45	19.72	19.34	18.92	18.48	-0.28	0.38	0.42	0.44	0.80	0.86	4.84e-14	8.38e-14	5.85e-14	1.04e-13	8.13e-13
9	18.93	19.27	18.95	18.63	18.26	-0.34	0.32	0.32	0.38	0.64	0.69	7.75e-14	1.27e-13	8.53e-14	1.35e-13	9.95e-13
10	19.08	19.78	19.52	19.13	18.80	-0.70	0.26	0.39	0.32	0.65	0.72	6.79e-14	7.95e-14	5.06e-14	8.56e-14	6.01e-13
11	18.78	19.58	19.40	18.96	18.47	-0.80	0.18	0.45	0.48	0.62	0.93	8.93e-14	9.50e-14	5.61e-14	1.00e-13	8.15e-13
12	18.65	19.06	18.70	18.38	18.02	-0.41	0.35	0.33	0.35	0.68	0.68	1.01e-13	1.54e-13	1.07e-13	1.71e-13	1.23e-12
13	20.07	20.31	19.93	19.52	19.10	-0.24	0.38	0.42	0.42	0.79	0.83	2.73e-14	4.87e-14	3.45e-14	5.97e-14	4.57e-13
14	20.26	20.55	19.98	19.54	19.07	-0.28	0.57	0.44	0.47	1.01	0.91	2.28e-14	3.91e-14	3.30e-14	5.86e-14	4.72e-13
15	19.71	19.89	19.47	19.10	18.66	-0.18	0.42	0.37	0.44	0.79	0.81	3.79e-14	7.17e-14	5.29e-14	8.77e-14	6.88e-13
16	19.78	20.23	19.89	19.52	18.96	-0.45	0.34	0.37	0.56	0.71	0.93	3.54e-14	5.23e-14	3.58e-14	5.94e-14	5.18e-13
17	20.51	21.35	21.37	20.87	20.79	-0.84	-0.02	0.50	0.07	0.48	0.58	1.82e-14	1.87e-14	9.19e-15	1.73e-14	9.63e-14
18	19.46	19.83	19.45	19.10	18.60	-0.37	0.38	0.35	0.50	0.73	0.85	4.77e-14	7.57e-14	5.36e-14	8.78e-14	7.24e-13
19	20.42	21.04	20.70	20.21	19.81	-0.63	0.35	0.49	0.40	0.83	0.89	1.97e-14	2.48e-14	1.71e-14	3.16e-14	2.38e-13
20	21.06	21.39	21.00	20.54	20.16	-0.33	0.39	0.46	0.38	0.85	0.84	1.09e-14	1.80e-14	1.29e-14	2.33e-14	1.72e-13
21	21.72	22.12	21.81	21.28	20.63	-0.40	0.31	0.53	0.65	0.84	1.18	5.97e-15	9.20e-15	6.13e-15	1.18e-14	1.12e-13
22	21.11	21.56	21.16	20.76	20.26	-0.45	0.39	0.40	0.51	0.80	0.90	1.05e-14	1.55e-14	1.11e-14	1.89e-14	1.57e-13
23	20.26	20.75	20.63	20.33	19.90	-0.49	0.12	0.30	0.43	0.42	0.73	2.28e-14	3.24e-14	1.81e-14	2.83e-14	2.19e-13
24	21.07	21.47	21.12	20.77	20.32	-0.41	0.36	0.35	0.45	0.70	0.80	1.09e-14	1.67e-14	1.16e-14	1.89e-14	1.48e-13
25	20.73	20.94	20.47	20.12	19.62	-0.22	0.47	0.35	0.51	0.82	0.85	1.49e-14	2.72e-14	2.10e-14	3.42e-14	2.84e-13

$U[Flux_j]=erg \cdot s^{-1} \cdot cm^{-2}$

Hα Global Parameters

Galaxy (1)	Number of knots (2)	SFR_{total} (3)	F_i (4)	F($H\alpha$) (5)	F_{net} (6)	F_{diff} (7)	$\Psi(\%)$ (8)	σ_{sky} (9)	F_{lim} (10)
Mrk 370	25	0.14	532.47	1099.68	687.25	412.43	48.42	6.43	19.27
Mrk 600	4	0.06	157.95	351.55	239.71	111.84	44.93	1.85	5.58
II Zw 40	10	1.16	10006.30	11612.31	11225.33	386.98	86.17	4.09	12.30
Mrk 5	2	0.05	229.69	229.69	231.21	···	100	6.53	19.60
II Zw 71	11	0.02	84.58	125.90	104.50	21.40	67.18	1.35	4.05
Mrk 297	30	9.67	1037.06	2144.02	1237.40	906.62	48.37	2.54	7.63
III Zw 102	65	0.82	407.47	1483.85	299.91	1183.94	27.46	1.33	3.98
Mrk 324	4	0.05	49.25	96.00	42.57	53.43	54.46	0.51	1.55
III Zw 107	3	2.97	386.82	457.72	446.21	11.51	84.51	0.98	2.97

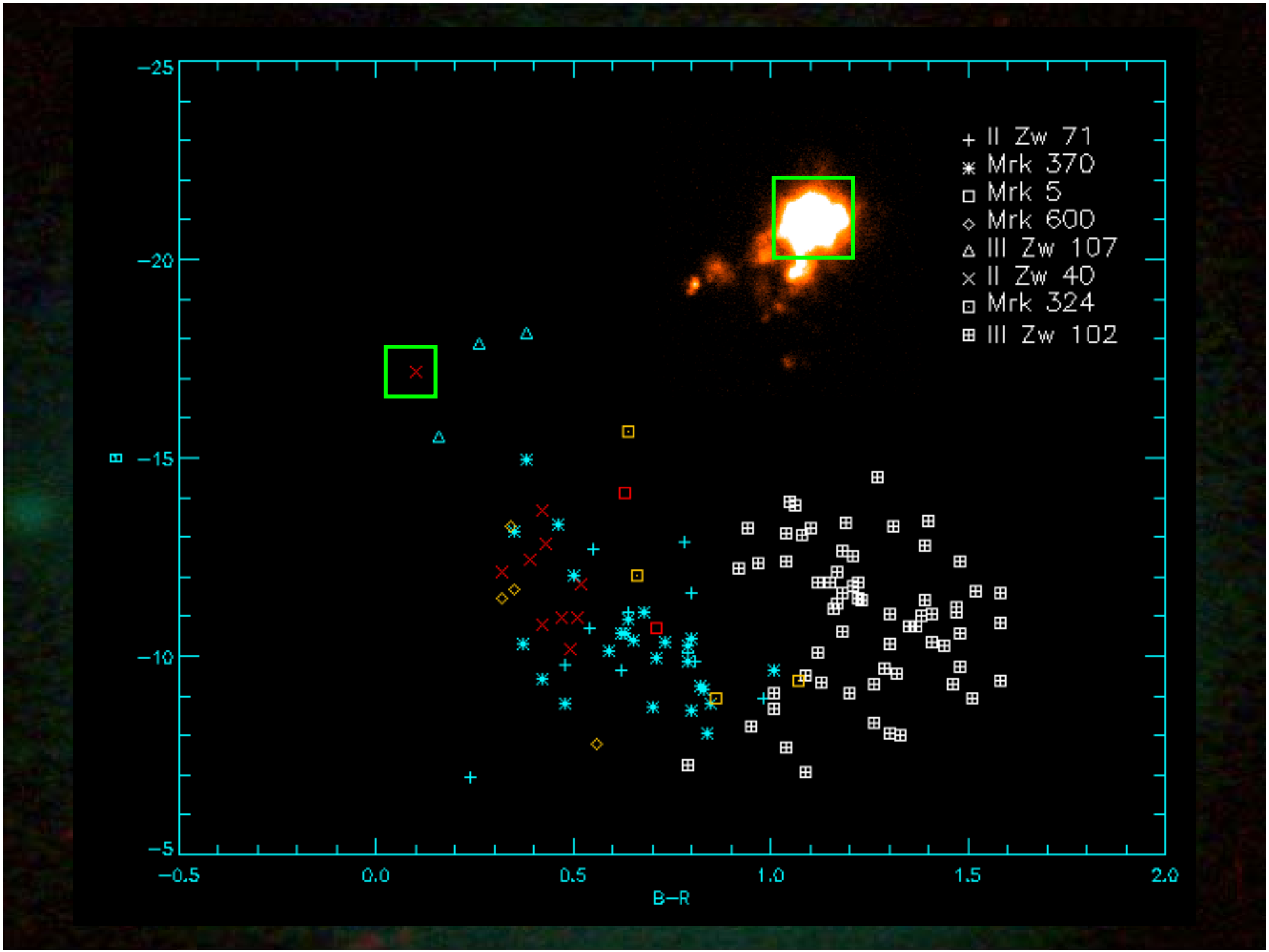
U[SFR]=$M_{\odot}\cdot yr^{-1}$; U[colums 4-7]=$10^{-15}erg\cdot s^{-1}\cdot cm^{-2}$; U[colums 4-7]=10^{-18} erg.s-1.cm-2

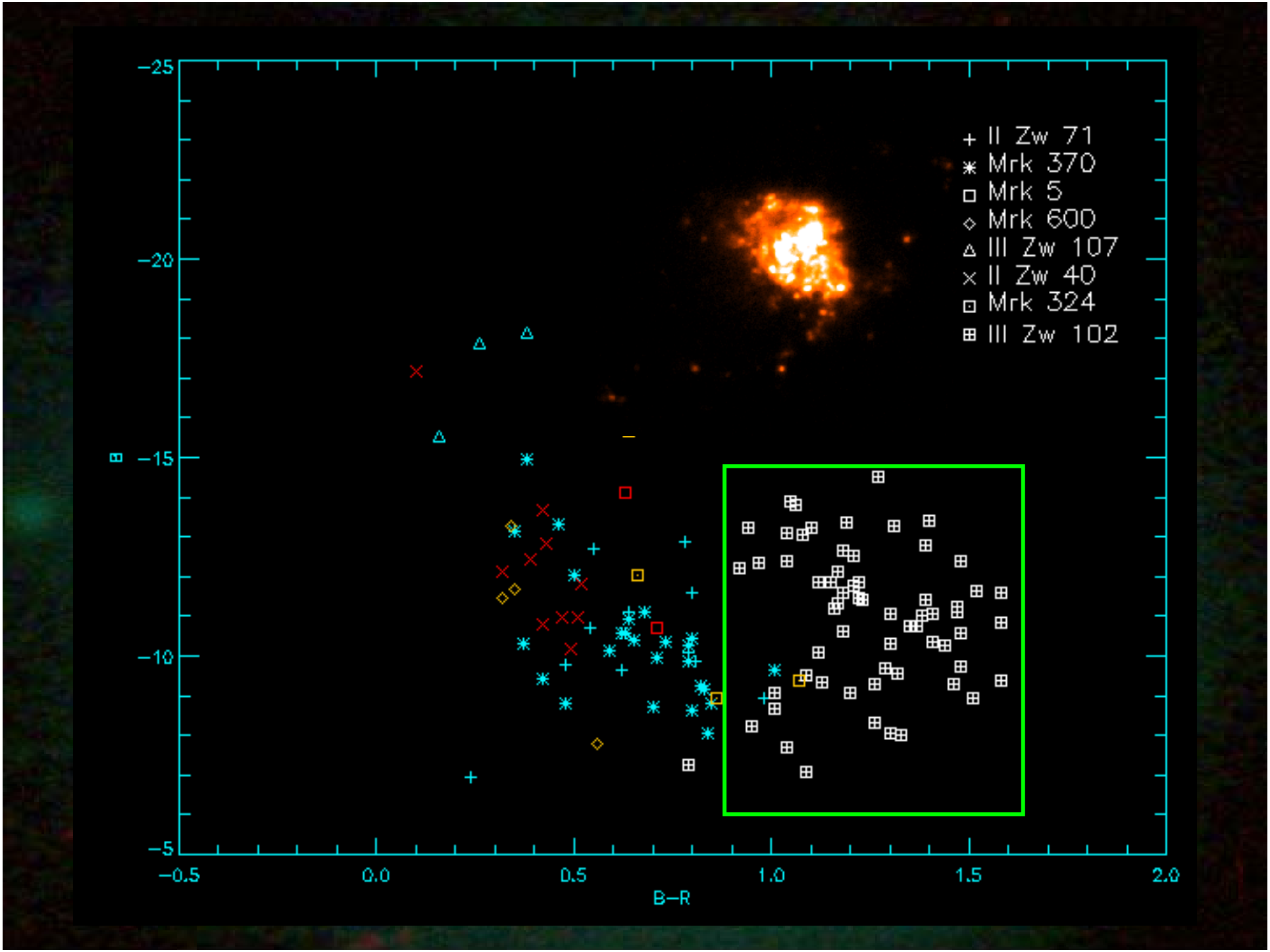
$$\Psi = \frac{\sum_{i}^{n} \mathrm{Fknot}_i}{\mathrm{F(H\alpha)}} \cdot 100$$

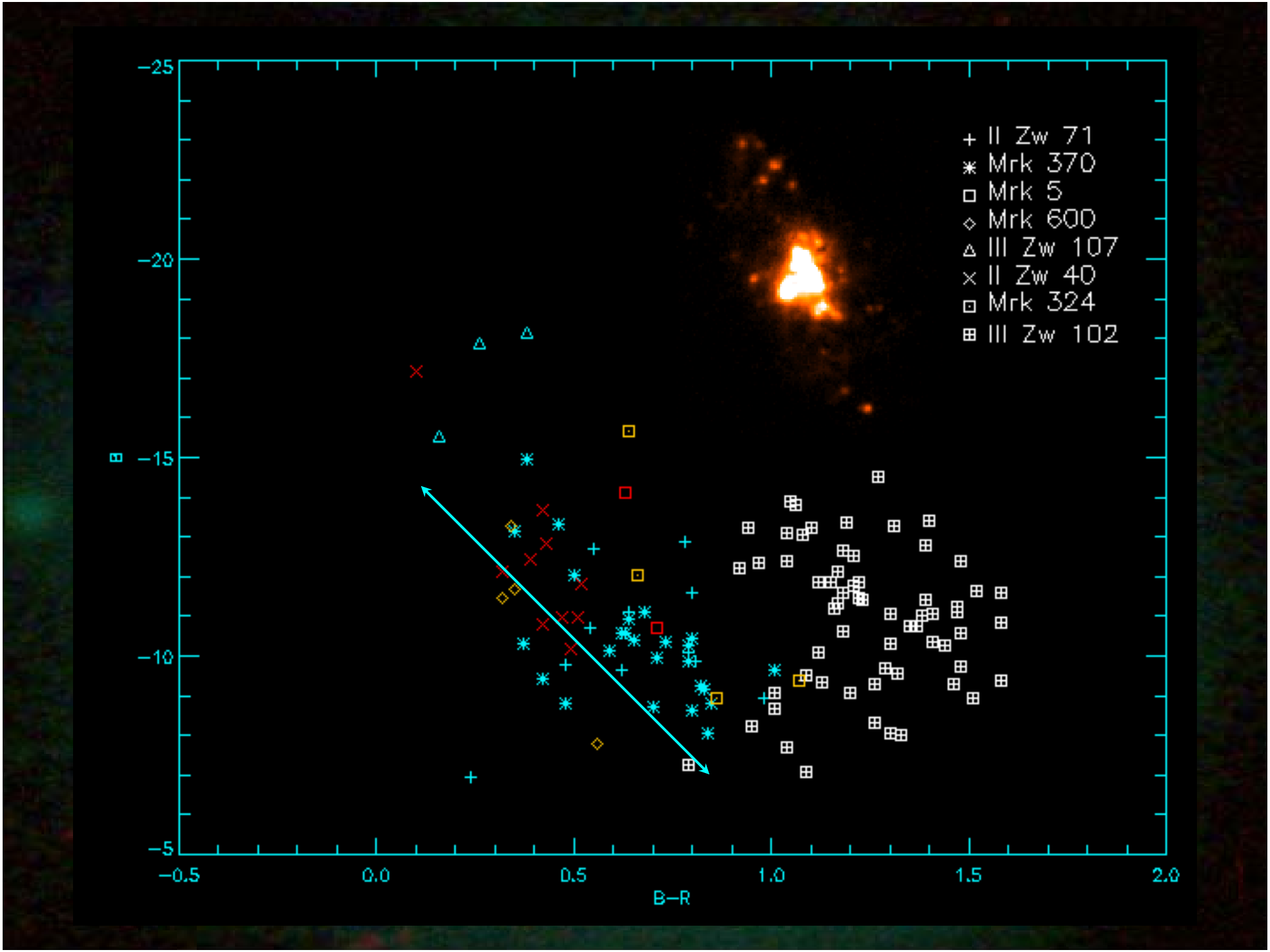
SUMMARY (CATALOGUE)

- TABLE

- Mentione;
- Fraccion de luz difusa…
- Alto numero de knots (en algunos casos)
- Tamanos tipicos


II Zw 71
Mrk 370
Mrk 5
Mrk 600
III Zw 107
II Zw 40
Mrk 324
III Zw 102
B
B−R
−25
−20
−15
−10
−5
−0.5
0.0
0.5
1.0
1.5
2.0


II Zw 71
Mrk 370
Mrk 5
Mrk 600
III Zw 107
II Zw 40
Mrk 324
III Zw 102
−25
−20
−15
−10
−5
B
−0.5
0.0
0.5
1.0
1.5
2.0
B−R


II Zw 71
Mrk 370
Mrk 5
Mrk 600
III Zw 107
II Zw 40
Mrk 324
III Zw 102
B
−25
−20
−15
−10
−5
−0.5
0.0
0.5
1.0
1.5
2.0
B−R

Sizes Ranges

