J/A+A/599/A83 ELG and AGN in WINGS clusters (Marziani+, 2017)

Emission line galaxies and active galactic nuclei in WINGS clusters.
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=2017A&A...599A..83M (SIMBAD/NED BibCode)

ADC_Keywords: Clusters, galaxy ; Galaxy catalogs ; Spectroscopy

Keywords: catalogs - galaxies: clusters: general -
galaxies: clusters: intracluster medium - galaxies: star formation -
galaxies: statistics - galaxies: evolution

Abstract:
We present the analysis of the emission line galaxies members of 46 low-redshift (0.04<z<0.07) clusters observed by WINGS (WIde-field Nearby Galaxy cluster Survey; Fasano et al., 2006A&A...445..805F). Emission line galaxies were identified following criteria that are meant to minimize biases against non-star-forming galaxies and classified employing diagnostic diagrams. We examined the emission line properties and frequencies of star-forming galaxies, transition objects, and active galactic nuclei (AGNs: LINERs and Seyferts), unclassified galaxies with emission lines, and quiescent galaxies with no detectable line emission. A deficit of emission line galaxies in the cluster environment is indicated by both a lower frequency, and a systematically lower Balmer emission line equivalent width and luminosity with respect to control samples; this implies a lower amount of ionized gas per unit mass and a lower star formation rate if the source is classified as Hii region. A sizable population of transition objects and of low-luminosity LINERs (~10-20% of all emission line galaxies) are detected among WINGS cluster galaxies. These sources are a factor of 1.5 more frequent, or at least as frequent, as in control samples with respect to Hii sources. Transition objects and LINERs in clusters are most affected in terms of line equivalent width by the environment and appear predominantly consistent with so-called retired galaxies. Shock heating can be a possible gas excitation mechanism that is able to account for observed line ratios. Specific to the cluster environment, we suggest interaction between atomic and molecular gas and the intracluster medium as a possible physical cause of line-emitting shocks.

Description:
Emission line parameters for 5859 galaxies in the central regions of 46 ROSAT clusters are presented.
Galaxies in the following clusters have been observed:
A1069 A119 A151 A1631a A1644 A1831 A193 A1983 A1991 A2107 A2124 A2169 A2382 A2399 A2415 A2457 A2572a A2589 A2593 A2622 A2626 A3128 A3158 A3266 A3376 A3395 A3490 A3497 A3556 A3560 A376 A3809 A500 A671 A754 A957x A970 IIZW108 MKW3s RX0058 RX1022 RX1740 Z2844 Z8338 Z8852

For each galaxy we report cluster membership, rest-frame equivalent width of Hbeta and Halpha, errors or censorship flags, diagnostic ratios with errors or censorship flag, probability of correct classification from the location in the diagnostic diagrams (DDs), fluxes derived from photometry, log of luminosity, and notes. The identification of 7 Seyfert 1s is reported in the notes. See Section 4.1 of the paper for a more detailed explanation.

File Summary:

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
catalog.dat	632	5859	Emission line catalog

See also:
J/A+A/566/A32 : Equivalent widths of WINGS galaxies (Fritz+, 2014)

Byte-by-byte Description of file: catalog.dat

Bytes	Format	Units	Label	Explanations
1- 5	A5	---	---	[WINGS]
6- 24	A19	---	WINGS	WINGS identifier (JHHMMSS.ss+DDMMSS.s)
26- 32	A7	---	Cluster	Cluster identification code
34	I1	---	Memb	[0/1] Membership (1)
36- 48	A13	---	IDS	Id with spectrum aperture number
50- 57	F8.3	---	SN	1-sigma S/N ratio close to [OIII]
59- 66	F8.3	---	ROII	?=-999 Ratio[OII]/rms[OII]
68- 75	F8.3	---	RHB	?=-999 Ratio Hbeta/rms$_{Hbeta}$ (6)

77- 84	F8.3	---	ROIII	?=-999 Ratio [OIII]/rms$_{[OIII]}$ (6)
86- 93	F8.3	---	ROI	?=-999 Ratio [OI]/rms$_{[OI]}$ (6)
95-102	F8.3	---	RHa	?=-999 Ratio Halpha/rms$_{Halpha}$ (6)
104-111	F8.3	---	RNII	?=-999 Ratio [NII]/rms$_{[NII]}$ (6)
113-123	F11.3	---	RSII	?=-999 Ratio [SII]/rms$_{[SII]}$ (6)
125	I1	---	Detect	[0/1] Detection of emission lines following criterion of Eq. 2
127-133	F7.3	0.1nm	EWMin	Minimum eq. width detectable at reported S/N, from Eq. A.1
135-142	F8.3	0.1nm	EWHb	?=-999 Rest-frame EW of Hbeta (6)
144-151	F8.3	0.1nm	e_EWHb	?=-999 Hbeta EW error
153-156	I4	---	f_EWHb	[-1/1]? Hbeta EW censorship (2)
158-165	F8.3	0.1nm	EWHa	?=-999 Rest-frame Halpha EW (6)
167-174	F8.3	0.1nm	e_EWHa	?=-999 Halpha EW error
176-181	F6.1	---	f_EWHa	[-1/0]? Halpha EW censorship (2)
183-190	F8.3	---	ROIIHB	?=-999 Log_10 [OII]/Hbeta (6)
192-199	F8.3	---	e_ROIIHB	?=-999 Lower error on Log[OII]/Hbeta
201-208	F8.3	---	E_ROIIHB	?=-999 Upper error on Log[OII]/Hbeta
210-213	I4	---	f_ROIIHB	[-1/1]? Log[OII]/Hbeta censorship (2)
215-222	F8.3	---	ROIIIHB	?=-999 Log_10 [OIII]/Hbeta (6)
224-231	F8.3	---	e_ROIIIHB	?=-999 Lower error on Log[OIII]/Hbeta
233-240	F8.3	---	E_ROIIIHB	?=-999 Upper error on Log[OIII]/Hbeta
242-245	I4	---	f_ROIIIHB	[-1/1]? Log[OIII]/Hbeta censorship (2)
247-254	F8.3	---	ROIHa	?=-999 Log_10 [OI]/Halpha (6)
256-263	F8.3	---	e_ROIHa	?=-999 Lower error on Log[OI]/Halpha
265-272	F8.3	---	E_ROIHa	?=-999 Upper error on Log[OI]/Halpha
274-277	I4	---	f_ROIHa	[-1/1]? Log[OI]/Halpha censorship (2)
279-286	F8.3	---	RNIIHa	?=-999 Log_10 [NII]/Halpha (6)
288-295	F8.3	---	e_RNIIHa	?=-999 Lower error on Log [NII]/Halpha
297-304	F8.3	---	E_RNIIHa	?=-999 Upper error on Log [NII]/Halpha
306-309	I4	---	f_RNIIHa	[-1/1]? Log[NII]/Halpha censorship (2)
311-318	F8.3	---	RSIIHa	?=-999 Log_10 [SII]/Halpha (6)
320-327	F8.3	---	e_RSIIHa	?=-999 Lower error on Log [SII]/Halpha
329-336	F8.3	---	E_RSIIHa	?=-999 Upper error on Log [SII]/Halpha
338-341	I4	---	f_RSIIHa	[-1/1]? Log[SII]/Halpha censorship (2)
343-344	A2	---	ClassOII	Class from [OII] DD (3)
346-354	E9.6	---	POIIHII	?=-999 HII probability in [OII] DD
356-365	E10.6	---	POIILIN	?=-999 LINER probability in [OII] DD
367-376	E10.6	---	POIISeyf	?=-999 Seyfert probability in [OII] DD
378-379	A2	---	ClassOIIRev	Revised class from [OII] DD (3)
381-382	A2	---	ClassOI	Class from [OI] DD (3)
384-385	A2	---	ClassNII	Class from [NII] DD (4)
387-396	E10.6	---	PNIIHII	?=-999 Probability of HII in [NII] DD
398-407	E10.6	---	PNIITO	?=-999 Probability of TO in [NII] DD
409-419	A11	---	PNIILIN	?=-999 Probability of LINER in [NII] DD
421-430	E10.6	---	PNIISeyf	?=-999 Seyfert probability in [NII] DD
432-433	A2	---	ClassNIIRev	Revised class from [NII] DD (4)
435-436	A2	---	ClassSII	Class from [SII] DD (3)
438-446	E9.4	10-2W/m2/nm	FL	? Specific flux at 5000
448-456	E9.4	10-2W/m2/nm	FLV	? Specific flux from V-band
458-465	F8.3	10-7W	logLHb	? Log_10 Hbeta emission line luminosity
467-470	I4	---	f_logLHb	[-1/1]? Hbeta luminosity censorship (2)
472-479	F8.3	10-7W	logLHa	? Log_10 Halpha emission line luminosity
481-484	I4	---	f_logLHa	[-1/1]? Halpha luminosity censorship (2)
486-632	A147	---	Notes	Notes on individual sources(5)

Note (1): Membership code:
1 = cluster member
0 = non-member

Note (2): Censorship flag as follows:
-1 = upper limit
1 = lower limit
0 = detection

Note (3): Class code as follow:
U = emission lines undetected
E = emission lines detected but no classification from DD
EH = HII
EL = LINER
ES = Seyfert

Note (4): Class code as follow:
U = emission lines undetected
E = emission lines detected but no classification from DD
EH = HII
EL = LINER
ES = Seyfert
ET = transition objects (TOs)

Note (5): Technical notes; identification of possible Seyfert candidates along with seven Seyfert 1s that have been identified:
WINGSJ012442.24+085124.4 WINGSJ034144.52-534221.1 (S1.9)
WINGSJ042931.90-613820.0 WINGSJ043838.78-220325.0 WINGSJ060131.87-401646.9
WINGSJ125732.47-173633.1 WINGSJ132513.37-313137.7.

Note (6): Errors codes:
-999 = unavailable
-888 = line intensity ratio cannot be computed because both lines are censored

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(End) Paola Marziani [INAF, Italy], Patricia Vannier [CDS] 04-Nov-2016

*The document above follows the rules of the Standard Description for Astronomical Catalogues; from this documentation it is possible to generate **f77** program to load files into arrays or line by line*