

Appendix A

Statistical Formula

A.1 Linear-correlation coefficient

$$r \equiv \frac{N \sum x_i y_i - \sum x_i \sum y_i}{\sqrt{N \sum x_i^2 - (\sum x_i)^2} \sqrt{N \sum y_i^2 - (\sum y_i)^2}}, \quad (\text{A.1})$$

where r is the linear-correlation coefficient, N is amount of the sample galaxies, x_i and y_i represent the correlated datasets (Bevington and Robinson, 2002).

A.2 t-distribution

$$t = r \sqrt{\frac{N-2}{1-r^2}}, \quad (\text{A.2})$$

where t is the t-value calculated for testing the significant of the linear correlation coefficient, $N - 2$ is the degrees of freedom of testing.

A.3 Chi-squared (χ^2)

$$\chi^2 = \sum \left[\frac{y_i - y(x_i)}{\sigma_i} \right]^2 = \sum \left[\frac{1}{\sigma_i} (y_i - a - bx_i) \right]^2, \quad (\text{A.3})$$

where y_i is the measured values of the parameters, $y(x_i)$ refers to the expectation values, σ_i is the uncertainties in the measured parameters y_i , while a and b represent the fitting parameters.

A.4 Reduced Chi-squared (χ^2_ν)

$$\chi^2_\nu = \frac{\chi^2}{\nu} = \sum \frac{1}{\nu} \left[\frac{y_i - y(x_i)}{\sigma_i} \right]^2, \quad (\text{A.4})$$

where ν corresponds to the degree of freedom which is equal to the difference of number of observations and the number of fitted parameters.

A.5 Specific uncertainty formula

For any function $f(u, v)$, a and b are defined as constants, u and v are variables (Bevington and Robinson, 2002),

$$x = au + bv \quad \sigma_x^2 = a^2 \sigma_u^2 + b^2 \sigma_v^2 + 2ab \sigma_{uv}^2 \quad (\text{A.5})$$

$$x = auv \quad \frac{\sigma_x^2}{x^2} = \frac{\sigma_u^2}{u^2} + \frac{\sigma_v^2}{v^2} + 2 \frac{\sigma_u v^2}{uv} \quad (\text{A.6})$$

$$x = au^b \quad \frac{\sigma_x}{x} = b \frac{\sigma_u}{u} \quad (\text{A.7})$$

$$x = ae^{bu} \quad \frac{\sigma_x}{x} = b \sigma_u \quad (\text{A.8})$$

$$x = a^{bu} \quad \frac{\sigma_x}{x} = (b \ln a) \sigma_u \quad (\text{A.9})$$

Appendix B

Observed Images of The Sample Galaxies From SDSS

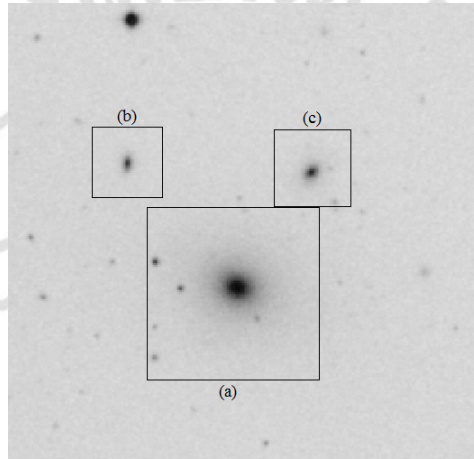


Figure B.1: a) NGC 4213, b) 2MARX J12154304+2400156 and c) 2MASX J12153399+2400116.

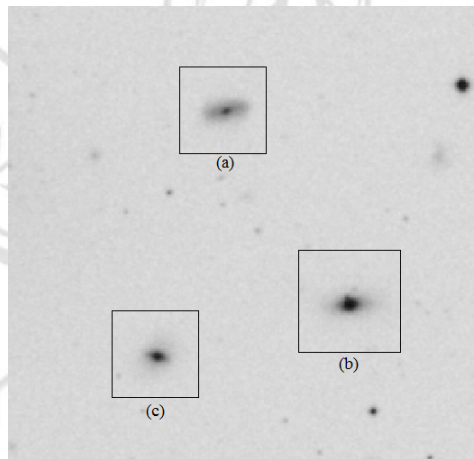


Figure B.2: a) 2MASX J12152202+2359376, b) IC 0772 and c) 2MASX J12152523+2356536.

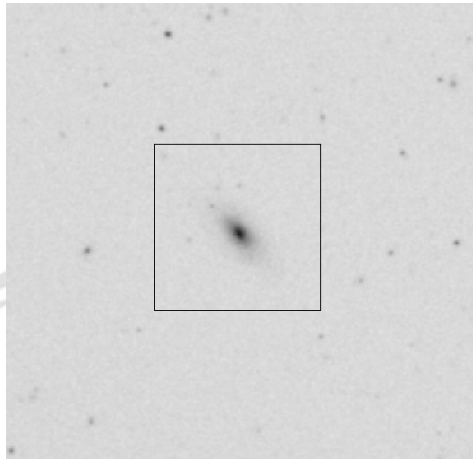


Figure B.3: UGC 07266.

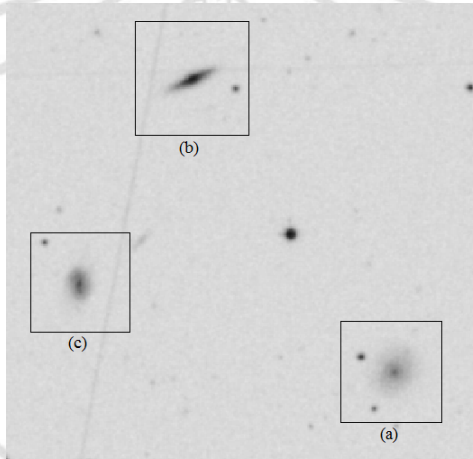


Figure B.4: a) KUG 1212+241, b) 2MFGC 09641 and c) 2MASX J12145681+2352066.

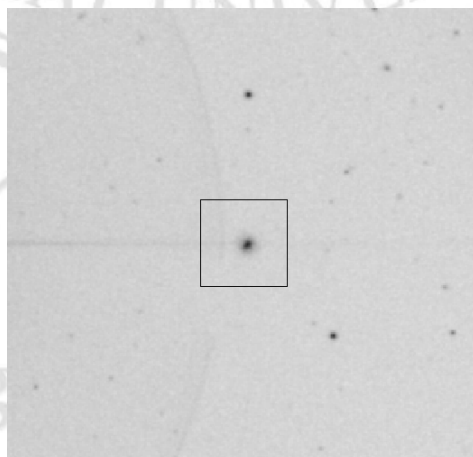


Figure B.5: 2MASX J12155377+2356477.

Appendix C

Available Spectral Line of The Sample Galaxies from SDSS

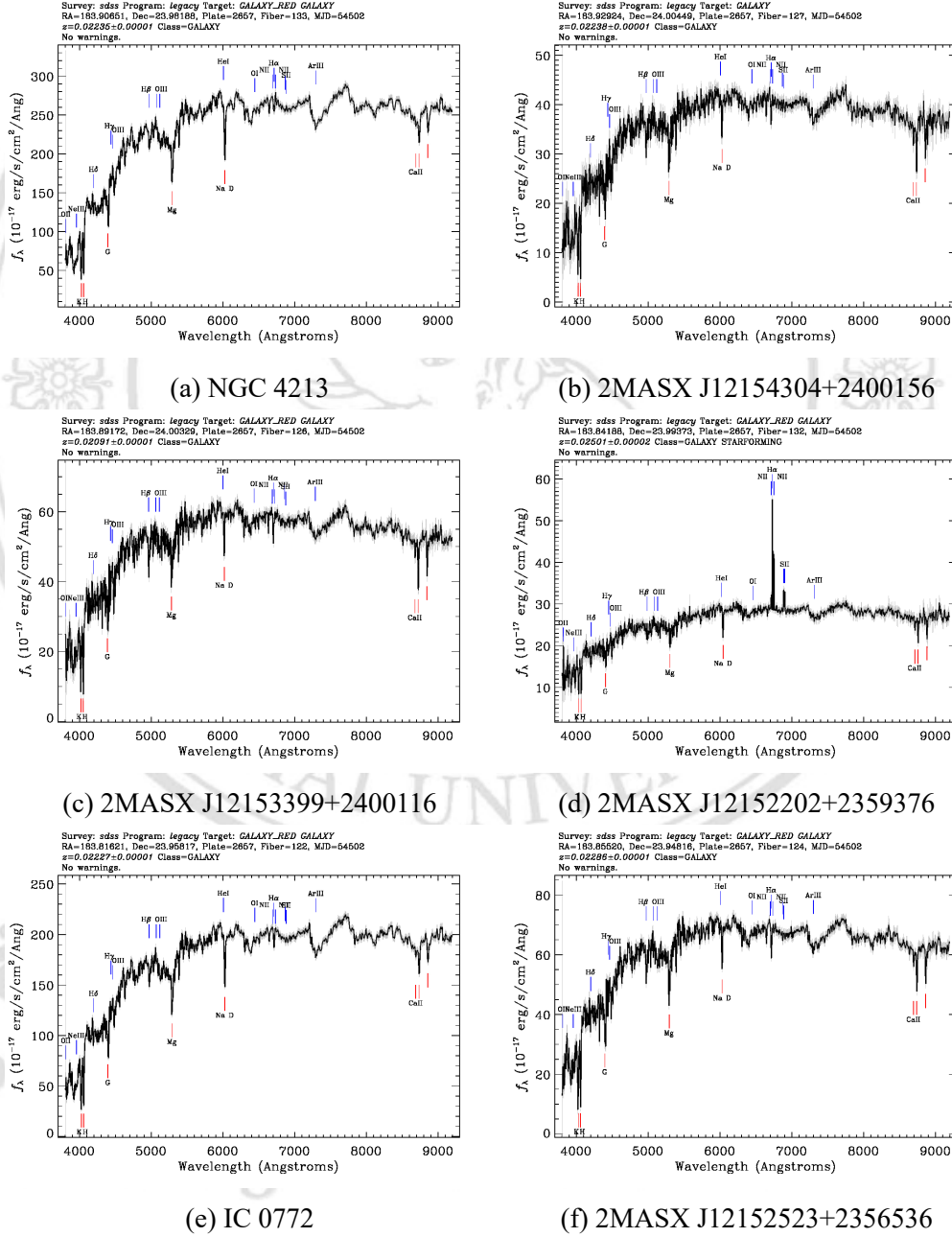


Figure C.1: Available spectral line of the sample galaxies.

Appendix D

Filter Transmission

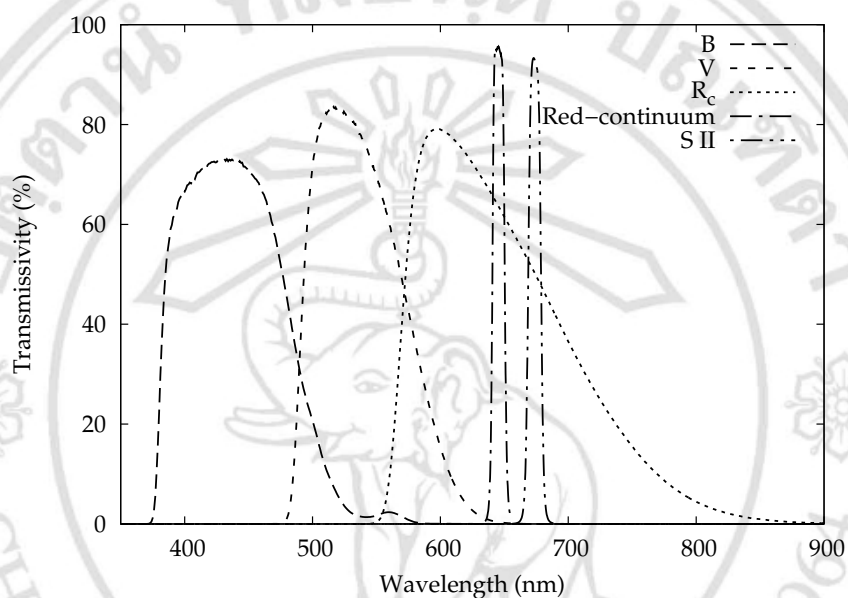


Figure D.1: Transmissivity profile of the filters that were used in this research.

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Appendix E

Available Data of The NGC 4213 Group Members from NED

Table E.1: The NGC 4213 Group members

Galaxy	Position (J2000)	z	v (km s ⁻¹)
SDSS J121511.66+235908.1	12h15m11.7s +23d59m08s	0.022936	6876.04
2MASX J12151669+2402146	12h15m16.6s +24d02m14s	0.023239	6966.88
2MASX J12152202+2359376	12h15m22.0s +23d59m37s	0.025094	7522.99
IC 0772	12h15m15.9s +23d57m29s	0.022315	6689.87
SDSS J121504.65+235600.2	12h15m04.6s +23d56m00s	0.022437	6726.44
2MASX J12152523+2356536	12h15m25.2s +23d56m53s	0.022963	6884.13
2MASX J12153399+2400116	12h15m34.0s +24d00m12s	0.020934	6275.86
UGC 07266	12h15m28.9s +24d05m33s	0.023093	6923.11
NGC 4213	12h15m37.5s +23d58m55s	0.022482	6739.93
2MFGC 09641	12h14m51.4s +23d54m24s	0.022389	6712.05
2MASX J12154304+2400156	12h15m43.0s +24d00m16s	0.022455	6731.84
2MASX J12145681+2352066	12h14m56.8s +23d52m07s	0.023780	7129.06
2MASX J12154530+2404107	12h15m45.2s +24d04m11s	0.021608	6477.92
SDSS J121551.21+240023.8	12h15m51.1s +24d00m24s	0.022432	6724.94
2MASX J12155377+2356477	12h15m53.7s +23d56m47s	0.022275	6677.88
KUG 1212+241	12h14m41.4s +23d51m10s	0.022225	6662.89
SDSS J121558.31+240439.8	12h15m58.3s +24d04m40s	0.020815	6240.18
SDSS J121410.86+240410.3	12h14m10.9s +24d04m10s	0.024192	7252.58
2MASX J12155722+2352048	12h15m57.2s +23d52m05s	0.022664	6794.50
KUG 1211+244	12h14m26.3s +24d10m55s	0.022609	6778.01
CGCG 128-056	12h14m05.0s +24d04m03s	0.022389	6712.05
SDSS J121552.77+241351.8	12h15m52.8s +24d13m52s	0.028624	8581.26
SDSS J121616.68+235336.1	12h16m16.7s +23d53m36s	0.023581	7069.41
IC 3082	12h16m12.1s +23d50m32s	0.024043	7207.91
SDSS J121425.97+234548.2	12h14m26.0s +23d45m48s	0.022200	6655.39
IC 3084	12h16m23.4s +23d55m04s	0.022599	6775.01

Appendix F

The $H\alpha$ Luminosities and SFR by James et al. (2005) Method

Table F.1: The $H\alpha$ luminosities and star formation rates.

Galaxy No.	$L_{H\alpha}(10^5 L_{\odot})$	$\sigma_{L_{H\alpha}}(10^5 L_{\odot})$	$SFR(M_{\odot} \text{yr}^{-1})$	$\sigma_{SFR}(M_{\odot} \text{yr}^{-1})$
1	282.962	98.765	0.860	0.300
2	5.693	4.341	0.017	0.013
3	9.683	9.690	0.029	0.029
4	133.408	13.796	0.405	0.042
5	122.241	32.983	0.372	0.100
6	59.381	14.705	0.180	0.045
7	156.575	24.389	0.476	0.074
8	128.778	13.484	0.391	0.041
9	102.903	20.533	0.313	0.062
10	144.206	11.390	0.438	0.035
11	34.068	6.833	0.104	0.021

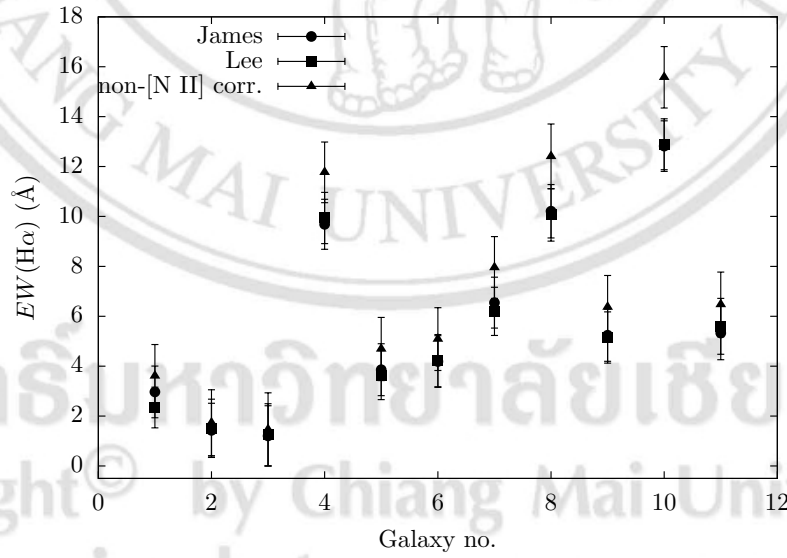


Figure F.1: The comparison of $EW(H\alpha)$ about two methods with respect to non-[N II] correction.

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