ASCA OBSERVATION OF GROUPS OF GALAXIES

Y. TAWARA, S. SATO, A. FURUZAWA AND K. YAMASHITA
Dept. of Physics, Nagoya University, Furo-cho, Chikusa, Nagoya 464-01, Japan
K. ISOBE
Toshiba Corporation, Shibaura 1-1-1, Minato, Tokyo 105-01, Japan
AND
Y. KUMAI
Kumamoto-gakuen University, Ohe 2-5-1, kumamoto,862, Japan

1. X-ray Properties of Group of Galaxies

Based on the ASCA observations, the X-ray features like spatial extentions and spectral properties of their component were analyzed for nearby four compact groups of galaxies; HCG62, NGC2300 group, HCG42 and HCG48. We found wide variety in their X-ray features. One of the brightest source of HCG62 shows the presence of cool component and enhanced abundance at its center, while HCG42 shows less extention and low abundance ratio of α-element to iron. For NGC 2300 group, we also found interesting feature which may be related to galaxy-intragroup medium interaction.

2. Abundance and Group Environment

There is wide variety of the hot gas property in the present group samples. To consider this point, we first derived stellar mass, gas mass and total gravitating mass for each group under the spherically symmetric distribution of gas. The results are summarized in the table 1, together with values for typical cluster of galaxies. We also derive the indicator of the strength of galactic wind relative to gravitational binding force. If we normarize this value by that for HCG 62, then the same value for NGC 2300, 10 times larger value for HCG 42 and 10 times lower value for typical cluster are obtained. Then very low gas mass or X-ray luminosity or peculiar abundance

K. Koyama et al. (eds.), The Hot Universe, 327-328.

can be interpreted by strong galactic wind, which can blow out their gas out side the group potential region.

E_{wind} $L_B(E,So)$: galactic wind energy

E_{bind} $M_{total}\, M_{gas} / R$: binding energy for gas

Sysytem	L_B (10^{11}Lo)	M_{galaxy} (10^{12}Mo)	R (kpc)	M_{gas} (10^{12}Mo)	M_{total} (10^{12}Mo)	E_{wind} / E_{bind} (HCG62--->1.0)	kT (keV)	Ab(Fe) (Solar)	Ref
Cluster	130	65	3000	300	1170	0.1	2-10	0.3	a
NGC3923	0.49	0.39	16	0.0001	1.2	3600.	0.67	0.12	e
NGC4636	0.29	0.27	350	0.6	10	0.9	0.75	0.93	d
HCG62	1	0.8	300	1.4	12	1.0	0.86	0.26	a
N2300 Gr.	0.5	0.6	250	0.6	10	1.2	0.87	0.16	a
HCG51	1.9	1.5	370	1.4	20	1.4	1.1	0.25	b
WP23	2.3	1.6	350	1.5	15	2.0	0.85	0.29	b
HCG42	3	2	120	0.2	10	10.0	0.36	-	a
HCG92	1	0.5	80	0.02	6	37.0	0.76	0.08	c

a) this work, b) Fukazawa et al. '96, c) Awaki et al. '96, d) Matsushita et al. '97, e) Sato et al. '97

Table 1. Relative Strength of Galactic Wind

3. References

Fukazawa, Y. et al. 1996, PASJ, 48, 395
Awaki, H. et al. 1997, PASJ, 49, 445.
Matsushita, K. et al., 1997, Ap. J., 488, L125.
Sato, S. et al., 1997, Ap. J. sumitted.

https://doi.org/10.1017/S0074180900115384 Published online by Cambridge University Press