

Suzaku observations of early-type galaxies

K. Matsushita¹, Y. Fukazawa², K. Hayashi², S. Konami¹,
R. Nagino¹, T. Ohashi³, Y. Tawara⁴ and M. Tozuka¹

¹Department of Physics, Tokyo University of Science, 1-3 Kagurazaka, Shinjyuku-ku, Tokyo 162-8601, Japan, email: matusita@rs.kagu.tus.ac.jp

²Department of Physical Science, Hiroshima University, 1-3-1 Kagamiyama, Higashi-Hiroshima, Hiroshima 739-8526, Japan

³Department of Physics, Tokyo Metropolitan University, 1-1 Minami-Osawa, Hachioji, Tokyo 192-0397, Japan

⁴Department of Physics, Nagoya University, Nagoya, Japan

The metal abundances in the hot X-ray emitting interstellar medium (ISM) of early-type galaxies give us important information about the present metal supply into the ISM through supernovae (SNe) Ia and stellar mass loss. In addition, O and Mg abundances should reflect the stellar metallicity and enable us to directly look into the formation history of these galaxies. The XIS instrument onboard the Suzaku satellite has an improved line spread function due to a very small low-pulse-height tail below 1 keV coupled with a very low background.

We derived abundance pattern of O, Ne, Mg and Fe of ISM of four elliptical galaxies, NGC 720 (Tawara *et al.* 2007), NGC 1399 (Matsushita *et al.* 2007a), NGC 1404 (Matsushita *et al.* 2007a), NGC 4636 (Hayashi *et al.* 2009), and two S0 galaxies, NGC 1316 (Konami *et al.* 2009), and NGC 4382 (Nagino *et al.* 2009) observed with Suzaku, and compared with those of two cD galaxies, M 87 (Matsushita *et al.* 2003), and NGC 4696 (Matsushita *et al.* 2007b) observed with XMM.

The Fe abundances of the ISM of these galaxies are about 0.5–1 solar, indicating that the present SN Ia rate is low. The O, Ne and Mg abundances are consistent with stellar metallicity. The abundance patterns of the ellipticals and cDs, and NGC 1316 are not so different from the solar pattern, using new solar abundance by Lodders (2003), and consistent with a mixture of SNe Ia and metal-poor Galactic stars. These galaxies are giant galaxies and their ISM temperatures are 0.6~1 keV. In contrast, a S0 galaxy, NGC 4382, with an ISM temperature of 0.3 keV, has a smaller O/Fe ratio in the ISM. This result means that the ISM in this galaxy contains more SNIa products.

References

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