H_0 FROM DISTANT CLUSTERS OF GALAXIES OBSERVED WITH *ASCA*

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ASCA, Japanese X-ray Sattelite, can obtain the spatial distribution of density and temperature of the intracluster medium at the same time and greatly improve the accuracy for the derivation of the Hubble constant using the thermal Sunyaev-Zel'dovich effect. Table 1 shows the results of *ASCA* observations of 4 distant clusters of galaxies. The parameters of the density distribution were obtained assuming the β model.

Table 1. Xray Data

Target	redshift	$\overline{kT_g}$ (keV)	$F_X(2-10keV)$ (10^{-12}ergs/s/cm^2)	θ_c (arcmin.)	β (10^4)
Cl0016+16	0.541	8.0 ± 1.0	1.64 ± 0.16	0.6	0.70
A773	0.217	8.7 ± 0.7	6.66 ± 1.00	0.8	0.68
A665	0.182	8.6 ± 0.7	12.4 ± 1.9	1.1	0.66
A2218	0.171	6.7 ± 0.3	8.11 ± 1.22	0.9	0.64

Combining the results of the radio observations (Birkinshaw et al., 1997, Carlstrom et al., 1997, Jones, 1997, private communications), average value of derived Hubble constant is around 60 $\pm$ 20 km/s/Mpc at the redshift range of 0.17-0.54. This error includes the uncertainty due to the radial distribution of the temperature. Recent high quality radio observations also indicate $H_0 = 50 \sim 60$ km/s/Mpc (Hughes et al. 1997, preseneted at IAU S188).

These values are slightly smaller than the value obtained with the Cepheid variables $\sim$ 70 km/s/Mpc. This discrepancy may be caused by the systematic error of the methods using the S-Z effect due to the cluster-cluster merging or indicate the non-zero cosmological constant, Λ_0.

K. Sato (ed.), Cosmological Parameters and the Evolution of the Universe, 66.