## S12b A probe of distant matter with X-rays —ASCA observation of the z=4.3 quasar RXJ1028.6-0844

W. Yuan, M. Matsuoka, S. Ueno (NASDA), H. Kubo (TIT), T. Mihara (RIKEN)

Photoelectric absorption in the soft X-ray spectra of quasars provides unique probes of circum-source matter and quasar evolution. We report the discovery of evidence for substantial low-energy cutoff in the ASCA spectrum of the high redshift (z=4.28) radio quasar RXJ1028.6-0844. The most likely explanation is photoelectric absorption of the soft X-rays. Our result indicates that the excess X-ray absorption may be common for radio loud quasars at z > 4. The equivalent hydrogen column density of the absorber, depending on the distance to the observer and the metallicity, ranges from  $2.5 \times 10^{21} cm^{-2}$  for local absorption up to  $2 \times 10^{23} cm^{-2}$  for absorption at the quasar redshift, or even higher if the metallicity is sub-solar. Such a value is among the largest ever found for high-redshift radio quasars. The absorption, if interpreted as being produced at a high redshift, may indicate the presence of a remarkably large amount of obscuring matter in the quasar environment in the early universe. The result provides a further piece of evidence for cosmological evolution of quasars, and probably an indication of different environments of radio-loud and radio-quiet quasars.